OPTIMUM®
MASCHINEN - GERMANY

Operating Manual

Version 1.0.6

Lathe

OPTIturn® TH 5620V

Part no. 346 2175

EN

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Preface

Dear customer,

Thank you very much for purchasing a product made by OPTIMUM.

OPTIMUM metal working machines offer a maximum of quality, technically optimum solutions and convince by an outstanding price performance ratio. Continuous enhancements and product innovations guarantee state-of-the-art products and safety at any time.

Before commissioning the machine please thoroughly read these operating instructions and get familiar with the machine. Please also make sure that all persons operating the machine have read and understood the operating instructions beforehand.
Keep these operating instructions in a safe place nearby the machine.

Information

The operating instructions include indications for safety-relevant and proper installation, operation and maintenance of the machine. The continuous observance of all notes included in this manual guarantee the safety of persons and of the machine.

The manual determines the intended use of the machine and includes all necessary information for its economic operation as well as its long service life.

In the paragraph "Maintenance" all maintenance works and functional tests are described which the operator must perform in regular intervals.

The illustration and information included in the present manual can possibly deviate from the current state of construction of your machine. Being the manufacturer we are continuously seeking for improvements and renewal of the products. Therefore, changes might be performed without prior notice. The illustrations of the machine may be different from the illustrations in these instructions with regard to a few details. However, this does not have any influence on the operability of the machine.
Therefore, no claims may be derived from the indications and descriptions. Changes and errors are reserved!

Your suggestion with regard to these operating instructions are an important contribution to optimising our work which we offer to our customers. For any questions or suggestions for improvement, please do not hesitate to contact our service department.

If you have any further questions after reading these operating instructions and you are not able to solve your problem with a help of these operating instructions, please contact your specialised dealer or directly the company OPTIMUM.

Optimum Maschinen Germany GmbH

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1 Safety

Glossary of symbols

►	provides further instructions
→	calls on you to act
O	enumerations

This part of the operating instructions

- O explains the meaning and use of the warning notes included in these operating instructions,
- O defines the intended use of the lathe,
- O points out the dangers that might arise for you or others if these instructions are not observed,
- O informs you about how to avoid dangers.

In addition to these operation instructions, please observe

- O the applicable laws and regulations,
- O the statutory provisions for accident prevention,
- O the prohibition, warning and mandatory signs as well as the warning notes on the lathe.

European standards must be observed during the installation, operation, maintenance and repair of the lathe.

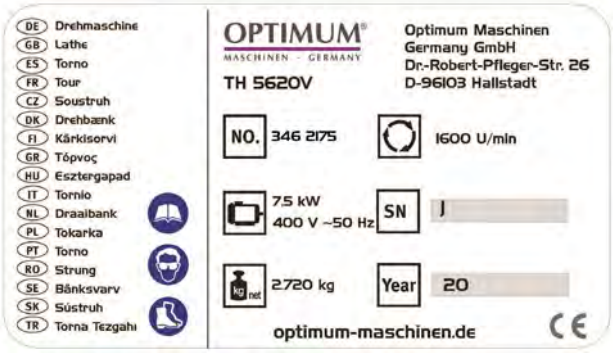
If European standards have not yet been incorporated in the national legislation of the country of destination, the specific applicable regulations of each country must be observed.

If applicable, necessary measures must be taken to comply with the country-specific regulations before commissioning the lathe.

Always keep this documentation close to the lathe.

If you would like to order another operating manual for your machine, please indicate the serial number of your machine. Please find the serial number on the type plate.

1.1 Rating plate



INFORMATION

If you are unable to rectify an issue using these operating instructions, please contact us for advice:

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Email: info@optimum-maschinen.de

1.2 Safety instructions (warning notes)

1.2.1 Classification of hazards

We classify the safety warnings into different categories. The table below gives an overview of the classification of symbols (ideogram) and the warning signs for each specific danger and its (possible) consequences.

Symbol	Warning alert	Definition / consequence
	DANGER!	Impending danger that will cause serious injury or death to people.
	WARNING!	A danger that can cause serious injury or death.
	CAUTION!	A danger or unsafe procedure that can cause personal injury or damage to property.
	ATTENTION!	Situation that could cause damage to the lathe and the product and other types of damage. No risk of injury to people.
	INFORMATION	Practical tips and other important or useful information and notes. No dangerous or harmful consequences for people or objects.

In case of specific dangers, we replace the pictogram with

general danger

with a warning of

injury to hands,

hazardous electrical voltage,

or

rotating parts.

1.2.2 Pictograms

Warning: danger of slipping!

Warning: risk of stumbling!

Warning: hot surface!

Warning: biological hazard!

Warning: automatic start-up!

Warning: tilting danger!

Warning: suspended loads!

Caution, danger of explosive substances!

Activation forbidden!

Do not climb onto the machine!

Do not clean with compressed air!

The maximum rotational speed must not be exceeded!

Read the operating instructions before commissioning!

Wear protective glasses!

Wear protective gloves!

Wear safety shoes!

Wear a protective suit!

Use ear protection!

Do not switch at a speed of more than 500 min^{-1}

Protect the environment!

Contact address

1.3 Intended use

WARNING!

Improper use of the lathe will result in

- **will endanger personnel,**
- **will endanger the lathe and other material property of the operator,**
- **the correct function of the lathe may be affected.**

The lathe is designed and manufactured to be used in environments where there is no potential danger of explosion.

The lathe is designed and manufactured for longitudinal and straight turning of round and regular formed
three-, six- or twelve-square workpieces in cold metal. The lathe must only be installed and operated in a dry and ventilated place.

If the lathe is used in any way other than described above, modified without authorization of Optimum Maschinen Germany GmbH, the lathe is being used for a purpose other than the intended purpose.

We will not be held liable for any damages resulting from any operation which is not in accordance with the intended use.

We expressly point out that the guarantee or CE conformity will expire, if any constructive, technical or procedural changes are not performed by the company Optimum Maschinen Germany GmbH.

It is also part of intended use that you

- observe the limits of the lathe,
- the operating manual is observed,

O the inspection and maintenance instructions are observed.

► Technical data on page 21

In order to achieve optimum cutting performance, it is essential to choose the right turning tool, feed, tool pressure, cutting speed and coolant.

WARNING!

Severe injuries due to non-intended use.

It is forbidden to make any modifications or alternations to the operation values of the lathe. They could endanger the personnel and cause damage to the lathe.

INFORMATION

The control and drive components of the lathe TH5620V with frequency converter are approved for industrial and commercial use within industrial supply systems. Their use in public supply networks is not permitted.

WARNING!

The lathe TH5620V is not intended for use in residential facilities where the power is supplied via a public low voltage supply system. ► Electrical connection TH5620V on page 34

1.4 Reasonably foreseeable misuse

Any other use other than that specified under "Intended use" or any use beyond the described use shall be deemed as non-intended use and is not permissible.

Any other use has to be discussed with the manufacturer.

The lathe must not be used to process metal, cold and non-inflammable materials.

In order to avoid misuse, it is necessary to read and understand the operating instructions before first commissioning.

Operators must be qualified.

1.4.1 Avoiding misuse

→ Use of suitable cutting tools.

→ Do not create in processing any continuous chips. Adjust the cutting speed when continuous chips are produced. Adapting the speed adjustment and feed to the material and workpiece.

→ Insert the workpiece tightly, without vibration and without one-sided imbalances.

→ The machine is not designed for the use of hand tools (e.g. emery cloth or files). It is forbidden to use any hand tools on this machine.

→ The machine is not suitable for attachment kits for cylindrical grinding. When mounting attachment kits for cylindrical grinding, additional protective devices must be fitted.

→ The machine is not designed to allow long parts to protrude beyond the spindle hole. If longer parts have to protrude beyond the spindle hole, an additional operator-side, permanent device must be mounted, which completely covers the protruding part and provides complete protection against spinning parts.

→ Long workpieces must be propped up. Use the steady rest or follow rest in conjunction with the tailstock spindle to support longer parts and prevent the workpiece from flapping around and flying away.

→ Risk of fire and explosion due to the use of flammable materials or cooling lubricants. Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit), it is necessary to take additional preventive measures in order to avoid health risks.

→ When processing carbons, graphite and carbon-fibre-reinforced carbons, the machine is no longer being used as intended. When processing carbons, graphite and carbon-fibre-

reinforced carbons and similar materials, the machine can be damaged quickly, even if the dusts generated are completely sucked out during the work process.

→ The processing of plastics with the lathe leads to static charge. The static charge of machine parts from processing plastics cannot be safely conducted away from the lathe.

→ When using lathe dogs as carriers for rotating workpieces between the lathe centres, the standard lathe chuck shield must be replaced with a circular lathe chuck shield.

1.5 Possible dangers caused by the lathe

The lathe has been tested for operational safety. The construction and type are state of the art.

Nevertheless, there is a residual risk as the lathe operates with

- high revolutions,
- rotating parts,
- electrical voltage and currents.

We have used construction resources and safety techniques to minimize the health risk to personnel resulting from these hazards.

If the lathe is used and maintained by personnel who are not duly qualified, there may be a risk resulting from incorrect or unsuitable maintenance of the lathe.

INFORMATION

Everyone involved in the assembly, commissioning, operation and maintenance must

- be duly qualified,
- and strictly follow these operating instructions.

In the event of improper use

- there may be a risk to personnel,
- there is a risk of damage to the lathe and other property,
- the correct function of the lathe may be affected.

Always disconnect the lathe, when cleaning or maintenance work is being carried out.

WARNING!

The lathe may only be used with the safety devices activated.

Disconnect the lathe immediately whenever you detect a failure in the safety devices or when they are not mounted!

All additional devices installed by the operator have to be equipped with the prescribed safety devices.

This is your responsibility being the operating company!

► **Safety devices on page 12**

1.6 Qualification of personnel

1.6.1 Target group

This manual is addressed to

- the operating companies,
- the operators,
- the maintenance personnel.

Therefore, the warning notes refer to both the operation and maintenance of the lathe.

Determine and indicate clearly who will be responsible for the different activities on the lathe (operation, maintenance and repair).

Unclear responsibilities constitute a safety risk!

Always disconnect the main plug of the lathe and secure the main switch using a lock. This will prevent it from being used by unauthorized persons.

The qualifications of the personnel for the different tasks are mentioned below:

Operator

The operator has been instructed by the operating company regarding the assigned tasks and possible risks in case of improper behaviour. Any tasks which need to be performed beyond the operation in standard mode must only be performed by the operator, if so indicated in these instructions and if the operator has been expressively commissioned by the operating company.

Qualified electrician

With professional training, knowledge and experience as well as knowledge of respective standards and regulations, qualified electricians are able to perform work on the electrical system and recognise and avoid any possible dangers.

Qualified electricians have been specially trained for the working environment, in which they are working and know the relevant standards and regulations.

Qualified personnel

Thanks to professional training, knowledge and experience as well as knowledge of relevant regulations the qualified personnel is able to perform the assigned tasks and to independently recognise and avoid any possible dangers themselves.

Instructed person

Instructed persons were instructed by the operating company regarding the assigned tasks and any possible risks of improper behaviour.

1.6.2 Authorized personnel

WARNING!

Inappropriate operation and maintenance of the lathe constitutes a danger for the personnel, objects and the environment.

Only authorized personnel may operate the lathe!

Persons authorized to operate and maintain should be trained technical personnel and instructed by the ones who are working for the operating company and for the manufacturer.

1.6.3 Obligations of the operating company

The operator must instruct the personnel at least once a year regarding

- all safety standards that apply to the lathe.
- the operation,
- generally accepted engineering standards.

The operating company must also

- check the personnel‘s knowledge level,
- document the training/instruction,
- require personnel to confirm participation in training/instructions by means of a signature,
- check whether the personnel is working in a safety and risk-conscious manner and following the operating instructions.
- define and document the inspection deadlines for the machine in accordance with the Factory Safety Act and perform an operational risk analysis in accordance with the Work Safety Act.

1.6.4 Obligations of the operator

The operator must

- O have read and understood the operating manual,
- O be familiar with all safety devices and regulations,
- O be able to operate the lathe.

1.6.5 Additional requirements regarding the qualification

Additional requirements apply for work on electrical components or equipment:

- O Must only be performed by a qualified electrician or person working under the instructions and supervision of a qualified electrician.

Before starting work on electrical parts or operating agents, following measures are to be performed in the following order:

→ disconnect all poles
→ secure against restarting
→ check that there is no voltage

1.7 Operator positions

The operator position is in front of the lathe.

1.8 Safety measures during operation

CAUTION!

Danger due to inhaling dust and mist that is hazardous to health.

Dependent on the material which need to be processed and the used auxiliaries dusts and mist may be caused which might impair you health.

Make sure that the generated health hazardous dusts and mist are safely sucked off at the point of origin and is dissipated or filtered from the working area. To do so, use a suitable extraction unit.

CAUTION!

Risk of fire and explosion by using flammable materials or cooling lubricants.

Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit) it is necessary to take additional preventive measures in order to safely avoid health risks.

CAUTION!

Risk of becoming entangled or lacerations when using hand tools.

The machine is not designed for the use of hand tools (e.g. emery cloth or files). It is forbidden to use any hand tools on this machine.

Before processing inflammable materials (e.g. aluminium, magnesium) or using inflammable auxiliary materials (e.g. spirit) it is necessary to take additional preventive measures in order to safely avoid health risks.

1.9 Safety devices

Use the lathe only with properly functioning safety devices.

Stop the lathe immediately if there is a failure on the safety device or if it is not functioning for any reason.

It is your responsibility!

If a safety device has been deactivated or is defective, the lathe can only be used again if you

- O the cause of the fault has been eliminated,
- O you have verified that there is no danger to personnel or objects.

WARNING!

If you bypass, remove or override a safety device in any other way, you are endangering yourself and other persons working on the lathe. The possible consequences are:

- **o injuries due to components or parts of components flying off at high speed,**
- **o contact with rotating parts,**
- **o fatal electrocution,**
- **o pulling-in of clothes.**

The lathe includes the following safety devices:

- O a lockable main switch,
- O an emergency stop switch,
- O a lathe chuck protection with position switch,
- O a protective cover on the headstock with position switch,
- O a mechanical spindle brake,
- O Protective covers on the machine bed, the fixing screws of the protective covers are permanently connected to the protective covers.
- O a safety screw at the tailstock,
- O a recoil spring as protective cover on the lead screw, the coil spring prevents the pulling-in of clothes into the lead screw.
- O self disengaging, spring loaded hand wheels on the bed slide and cross slide,
- O an overload clutch on the feed rod,
- O a chips shield.

WARNING!

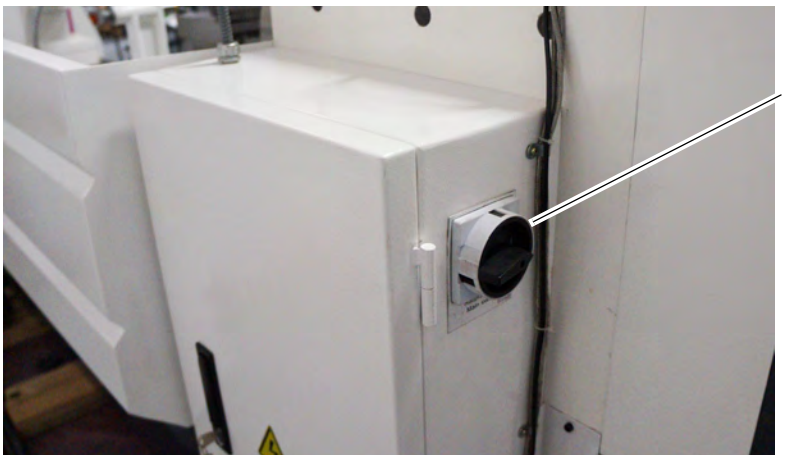
The separating protective equipment which is made available and delivered together with the machine is designed to reduce the risk of workpieces or fractions of them which being expelled, but not to remove them completely.

1.9.1 Lockable main switch

In the "0" position, the lockable main switch can be secured against accidental or non-authorised switching on by means of a padlock.

The power supply is interrupted by switchingoff the main plug.

Except for the areas marked by the pictogram in the margin. In these areas there might be voltage, even if the main switch is switched-off.



Img. 1-1: Main switch

TH5620V_GB_1.fm

WARNING!

Dangerous voltage even if the main switch is switched off.

The areas marked by the pictogram might contain live parts, even if the main switch is switched off.

1.9.2 Emergency stop switch

CAUTION!

The drive or the lathe chuck will continue to run for a while, depending on the mass moment of inertia of the lathe chuck and the workpiece.

The emergency stop mushroom switch brings the machine to a standstill.

Turn the knob to the right to unlock the emergency stop mushroom switch.

CAUTION!

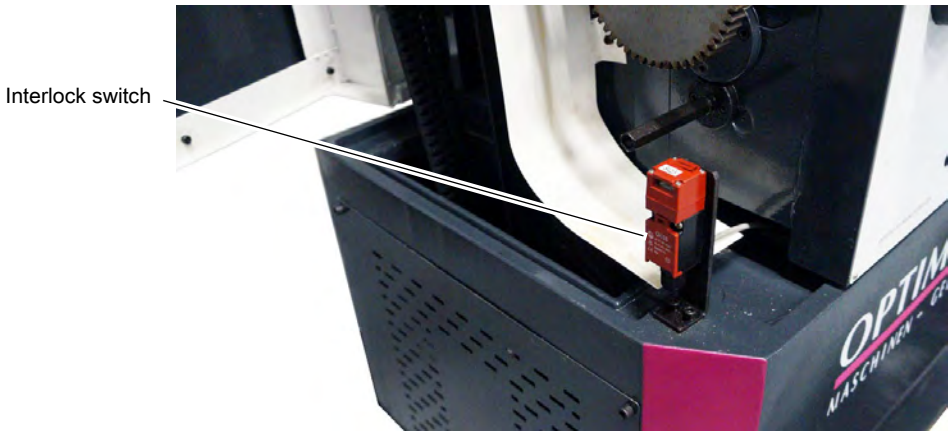
The emergency stop mushroom switch may only be activated in an emergency. An operational shut-down of the machine must not be executed using the emergency stop mushroom switch.

1.9.3 Self-disengaging hand wheels

The spring-loaded hand wheel on the bed slide and the hand wheel on the cross slide is self-disengaging. Both hand wheels must be held down so that a carriage movement can take place.

1.9.4 Protective cover of the headstock

The headstock of the lathe is equipped with a separating protective cover. The protective cover is equipped with an interlock switch and can only be opened when the machine is turned off.



Img. 1-2: Protective cover of the headstock

1.9.5 Protective covers drive

DANGER!

The machine may only be started back up when all safety covers have been installed and screwed on tightly.

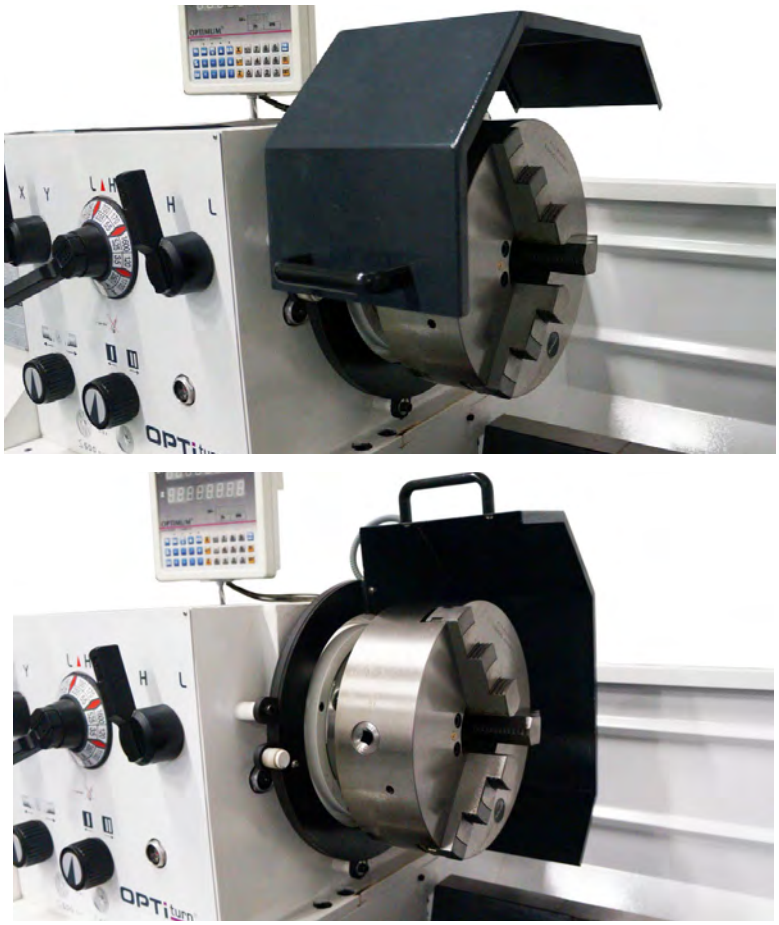
The machine bed of the lathe is equipped with permanently installed safety covers. The screws are captive connected to the protective covers.

WARNING!

Only remove the protective cover when the main switch of the lathe is turned off and secured by a padlock.

1.9.6 Lathe chuck protection with position switch

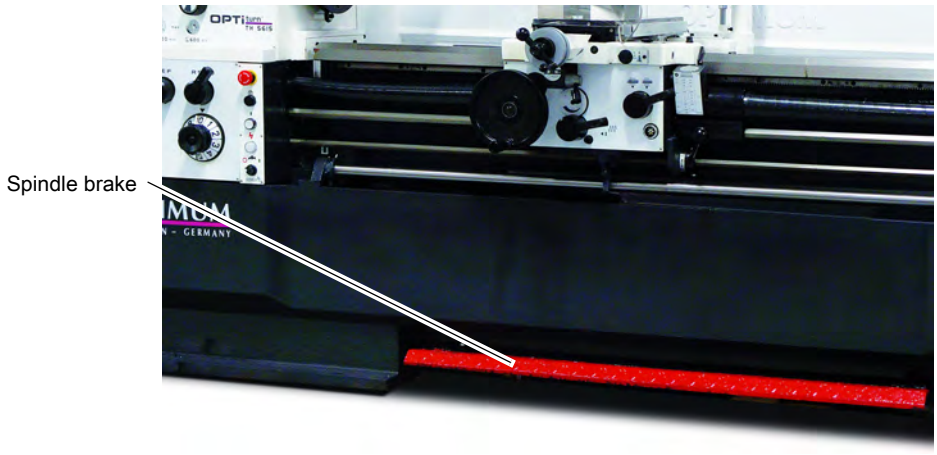
The lathe is equipped with a lathe chuck protection. The spindle of the lathe can only be switched on if the lathe chuck protection is closed.



Img. 1-3: Lathe chuck protection

1.9.7 Spindle brake

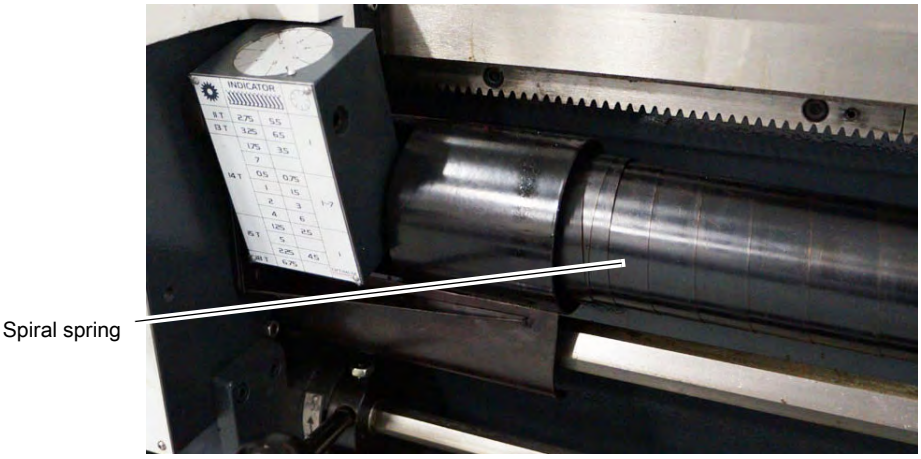
The lathe is equipped with an electromagnetic spindle brake. The brake is triggered with the foot pedal, the rotation lever or the emergency stop.



Img. 1-4: Spindle brake

1.9.8 Protective cover lead screw

The lead screw of the lathe is covered with a coil spring as a protective cover.



Img. 1-5: Lead screw with protective cover

1.9.9 Chip shield

Polycarbonate windows

The polycarbonate viewing window in chip protection, must be visual inspected by the customer responsible personnel at regular intervals to guarantee the operational safety of the machine.

Polycarbonate viewing panes are subject to an ageing process and are classified as wear parts.

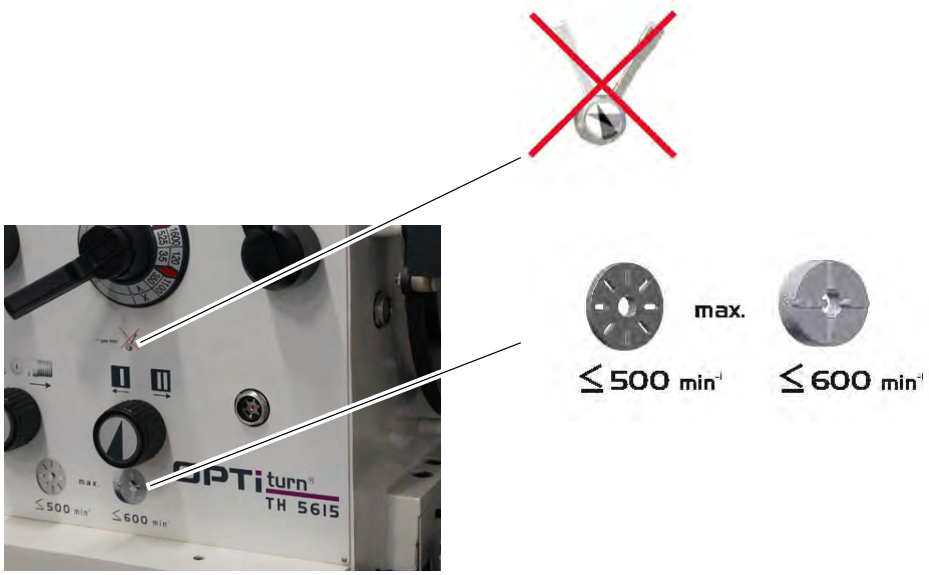
The aging of polycarbonate windows can not be detected by visual inspection. It is therefore necessary to replace the polycarbonate windows after a certain time.

Prolonged exposure from polycarbonate windows to cutting fluids can lead to accelerated ageing, i.e. deterioration of the mechanical properties (brittleness). Coolant vapours, detergents, greases and oils or other corrosive substances from the operator side can also lead to a deterioration of the polycarbonate windows. The result is a reduced retention capability of the polycarbonate viewing pane against flying chips.

1.9.10 Prohibition, warning and mandatory signs

INFORMATION

All warning and mandatory signs must be legible. They must be checked regularly.



Img. 1-6: Pictograms

Explanation of pictograms used: ► Pictograms on page 7

1.10 Safety check

Check the lathe at least once per shift. Inform the person responsible immediately of any damage, defects or changes in the operating function.

Check all safety devices

- at the beginning of each shift (with the machine stopped),
- once a week (with the machine in operation),
- after all maintenance and repair work.

Check that prohibition, warning and information signs and the labels on the lathe

- are legible (clean them, if necessary)
- are complete.

INFORMATION

Organise the checks according to the following table;

General check		
Equipment	**Check**	**OK**
Guards	Mounted, firmly bolted and not damaged	
Signs, Markers	Installed and legible	
Date:	**checked by (signature):**	

Functional check		
Equipment	**Check**	**OK**
EMERGENCY-STOP mushroom switch	After activating the emergency stop mushroom button, the control voltage on the lathe will shut off. The spindle continues to rotate for a while, depending on the mass moment of inertia of the spindle and workpiece.	
Position switch Lathe chuck protection	The spindle drive of the lathe must only be switch on if the lathe chuck protection is closed.	
Interlock switch protective cover on the headstock	The spindle drive of the lathe must only be switch on if the protective cover of the headstock is closed.	
Position switch Spindle brake	The spindle drive of the lathe must switch off also when the spindle brake is used.	
Date:	**checked by (signature):**	

1.11 Personal protective equipment

For certain work personal protective equipment is required.

Protect your face and your eyes: Wear a safety helmet with facial protection when performing work where your face and eyes are exposed to hazards.

Wear protective gloves when handling pieces with sharp edges.

Wear safety shoes when you assemble, disassemble or transport heavy components.

Use ear protection if the noise level (emission) in the workplace exceeds 80 dB (A).

Before starting work make sure that the required personal protective equipment is available at the work place.

CAUTION!

Dirty or contaminated personnel protective equipment can cause illness. It must be cleaned after each use and at least once a week.

1.12 Safety during operation

We provide information about the specific dangers when working with and on the lathe in the descriptions for these types of work.

WARNING!

Before activating the lathe ensure that this will neither endanger other persons nor cause damage to equipment.

Avoid any unsafe work methods:

Avoid any unsafe work methods:

- Make sure that your work does not endanger anyone.
- Clamp the workpiece tightly before activating the lathe.
- Observe the maximum lathe chuck opening.
- Use protective glasses!
- Do not remove the turning chips by hand. Use a chip hook and / or a hand brush to remove turning chips.

- Clamp the turning tool at the correct height and with the least possible overhang.
- Turn off the lathe before measuring the workpiece.
- The instructions mentioned in these operating instructions have to be strictly observed during assembly, operation, maintenance and repair.
- Do not work on the lathe if your concentration is reduced, for example, because you are taking medication.
- Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.
- Inform the supervisor about all hazards or faults.
- Stay at the lathe until all movements have come to a complete standstill.
- Use the prescribed personnel protective equipment. Make sure to wear a well-fitting work suit and, if necessary, a hairnet.

1.13 Safety during maintenance

Inform the operators in good time of any maintenance and repair works.

Report all safety-relevant changes and performance characteristics of the lathe. Any changes must be documented, the operating instructions updated and machine operators instructed accordingly.

1.13.1 Disconnecting and securing the lathe

Turn off the main switch of the lathe before starting any maintenance or repair work.

Use a padlock to prevent the switch from being turned on without authorization and keep the key in a safe place.

All machine parts as well as all dangerous voltages are switched off.

Excepted are only the positions which are marked with the adjoining pictogram. These positions may be live, even if the main switch is switched off.

Attach a warning sign to the lathe.

WARNING!

Live parts and moves of machine parts can injure you or others dangerously!

Proceed with extreme care if you cannot switch off
the lathe by turning off the main switch for necessary procedures (e.g. functional control).

1.13.2 Using lifting equipment

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death.

Check that the lifting and load-suspension equipment are of sufficient load-bearing capability and are in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other supervisory authorities responsible for your company.

Fasten the loads properly.

Never walk under suspended loads!

1.13.3 Mechanical maintenance work

Remove or install protection safety devices before starting or after completing any maintenance work; this include:

- covers,
- safety instructions and warning signs,
- grounding cables.

If you remove protection or safety devices, refit them immediately after completing the work.

Check if they are working properly!

1.14 Accident report

Inform your supervisors and Optimum Maschinen Germany GmbH immediately in the event of accidents, possible sources of danger and any actions which almost led to an accident (near misses).

There are many possible causes for "near misses".

The sooner they are notified, the quicker the causes can be eliminated.

INFORMATION

We provide information about the dangers of working with and on the lathe in these work descriptions.

1.15 Electrical system

► Qualified electrician on page 11

Have the machine and/or the electric equipment checked regularly. Immediately eliminate all defects such as loose connections, defective wires, etc.

A second person must be present during work on live components to disconnect the power in the event of an emergency. Disconnect the lathe immediately in case of failure of the power supply!

Comply with the required inspection intervals in accordance with the factory safety directive, operating equipment inspection DGUV, formerly BVG.

The operator of the machine must ensure that the electrical systems and operating equipment are inspected with regards to their proper condition, namely,

- by a qualified electrician or under the supervision and direction of a qualified electrician, prior to initial commissioning and after modifications or repairs, prior to recommissioning
- and at certain intervals.

The deadlines must be set so that arising, foreseeable defects can be detected in time.

The relevant electro-technical rules must be followed during the inspection.

The inspection prior to initial commissioning is not required if the operator receives confirmation from the manufacturer or installer that the electrical systems and operating equipment comply with the accident prevention regulations.

Permanently installed electrical systems and operating equipment are considered constantly monitored if they are continually serviced by qualified electricians and inspected by means of measurements in the scope of operation (e.g. monitoring the insulation resistance).

1.16 Inspection deadlines

Define and document the inspection deadlines for the machine in accordance with § 3 of the Factory Safety Act and perform an operational risk analysis in accordance with § 6 of the Work Safety Act. Also use the inspection intervals in the maintenance section as reference values. ► Checkup, inspection and maintenance on page 79.

INFORMATION

The frequency converter of TU5620V effectively tests itself. ► Monitoring the fail-safe functions of the frequency converter on page 44

2 Technical data

The following information represents the dimensions and indications of weight and the manufacturer‘s approved machine data.

2.1 Electrical connection	
	3 x 400V / 8.5 KW ~ 50 Hz
2.2 Drive motor power	
	7.5 KW
2.3 Work areas	
Height of centres [mm]	280
Distance between centres [mm]	1910
Travel of bed slide [mm]	1710
Swing diameter over machine bed [mm]	560
Swing diameter over cross slide [mm]	355
Main spindle bore [mm]	105
max. weight of workpiece between centers [kg]	500
2.4 Headstock	
Main spindle nose	Cam-lock fixing (DIN ISO 702-2) no. 8
Main spindle morse taper	Ø 113 (Taper 1:20) Reducing sleeve Ø 113 / MT5 is supplied with
Spindle speeds [min $^{-1}$]	25 - 1600
Gear levels	2 + infinitely variable
2.5 Feeds and pitches	
Longitudinal feed [mm/rev]	0.031 - 1.7 (42 pcs.)
Cross feed [mm/rev]	0.014 - 0.784 (42 pcs.)
Metric thread [mm / rev]	0.1 - 14 (41 pcs.)
Inch threads [threads / inch]	112 - 2 (60 pcs.)
Modular threads	0.1 - 7 (34 pcs.)
Diametral pitch threads	4 - 112 (50 pcs.)
Pitch lead screw	6mm
2.6 Slide	
Travel cross slide [mm]	316
Scale on cross slide	8mm/rev - splitting 0.05mm
Travel top slide [mm]	130
Scale at top slide	4mm/rev - splitting 0.02mm
Scale at bed slide	17mm/rev - splitting 0.1mm

Quick action tool holder	SWH7
maximum dimension of insertion for turning tool in quadruplicate tool holder [mm]	25 x 25
2.7 Tailstock	
Quill diameter [mm]	75
Spindle stroke [mm]	180
Taper in the quill	MT5
2.8 Machine dimensions	
Installation plan	► Installation plan on page 31
Weight [kg]	2560
2.9 Work area	Keep a work area of at least one metre around the machine free for operation and maintenance.
2.10 Dimensions and weight with packaging	
Height [mm]	1740
Length [mm]	3400
Depth [mm]	1150
Total weight [kg]	2980
2.11 Environmental conditions	
Temperature	5 - 35 °C
Relative humidity	25 - 80 %
2.12 Operating material	
Comparable lubricants ► „ Lubricant“ on page 145	
Headstock Mobilgear 627 or a comparable oil;	24
Apron gearbox Mobilgear 629 or a comparable oil;	3
Feed gear Mobilgear 629 or a comparable oil;	7.6
Bare steel parts and lubricating nipple,	Acid-free lubricating oil
Coolant equipment Commercially available cooling agent / lubricant approximate values	25 litres
2.13 Emissions	
Maximum sound pressure level at 1 m distance from the machine and 1.60 m above the ground.	87 dB(A) in idle running

CAUTION!

The operator on the machine must use noise and hearing protection.

INFORMATION

This numerical value was measured on a new machine under the operating conditions specified by the manufacturer. The noise behaviour of the machine might change depending on the age and wear of the machine. Furthermore, the noise emission also depends on production engineering factors, e.g. speed, material and clamping conditions.

3 Delivery, interdepartmental transport, assembly and commissioning

3.1 Notes on transport, installation, commissioning

Improper transport, installation and commissioning is liable to accidents and can cause damage or malfunctions to the machine for which we do not assume any liability or guarantee.

Transport the scope of delivery secured against shifting or tilting with a sufficiently dimensioned industrial truck or a crane to the installation site.

WARNING!

Severe or fatal injuries may occur if parts of the machine tumble or fall down from the forklift truck or from the transport vehicle. Follow the instructions and information on the transport box.

Note the total weight of the machine. The weight of the machine is indicated in the "Technical data" of the machine. When the machine is unpacked, the weight of the machine can also be read on the rating plate.

Only use transport devices and load suspension gear that can hold the total weight of the machine.

WARNING!

The use of unstable lifting and load suspension equipment that might break under load can cause severe injuries or even death. Check that the lifting and load suspension gear has sufficient load-bearing capacity and that it is in perfect condition.

Observe the accident prevention regulations issued by your Employers Liability Insurance Association or other competent supervisory authority, responsible for your company. Fasten the loads properly.

3.1.1 General risks during internal transport

WARNING: TILTING DANGER!

The machine may be lifted unsecured by a maximum of 2 cm.

Employees must be outside the danger zone, i.e. the reach of the load.

Warn employees and advise them of the hazard.

Machines may only be transported by authorized and qualified persons. Act responsibly during transport and always consider the consequences. Refrain from daring and risky actions.

Gradients and descents (e.g. driveways, ramps and the like) are particularly dangerous. If such passages are unavoidable, special caution is required.

Before starting the transport check the transport route for possible danger points, unevenness and faults.

Danger points, unevenness and disturbance points must be inspected before transport. The removal of danger spots, disturbances and unevenness at the time of transport by other employees leads to considerable dangers.

Careful planning of interdepartmental transport is therefore essential.

3.2 Unpacking the machine

INFORMATION

The lathe is delivered pre-assembled.

Transport the lathe in its packing crate near its final installation site with a forklift before unpacking it. If the packaging shows signs of possible transport damage, take the necessary precautions not to damage the machine when unpacking. If any damage is discovered, the carrier and/or shipper must immediately be notified of this fact to establish any claim which might arise.

Inspect the machine completely and carefully, making sure that all materials, such as shipping documents, manuals and accessories supplied with the machine have been received.

3.3 Scope of delivery

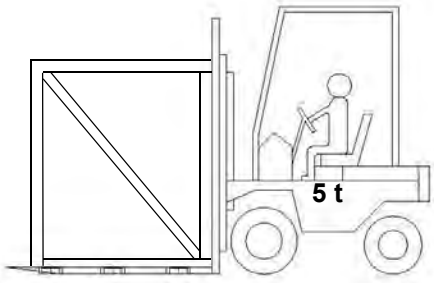
When the lathe is delivered, please check immediately that it has not been damaged during transport.
Also check that no fastening screws have come loose. Compare the scope of delivery with the attached packing list.

3.4 Transport

O Weights

► Dimensions and weight with packaging on page 22

Weight of the lathe ► „ Weight [kg]“ on page 22

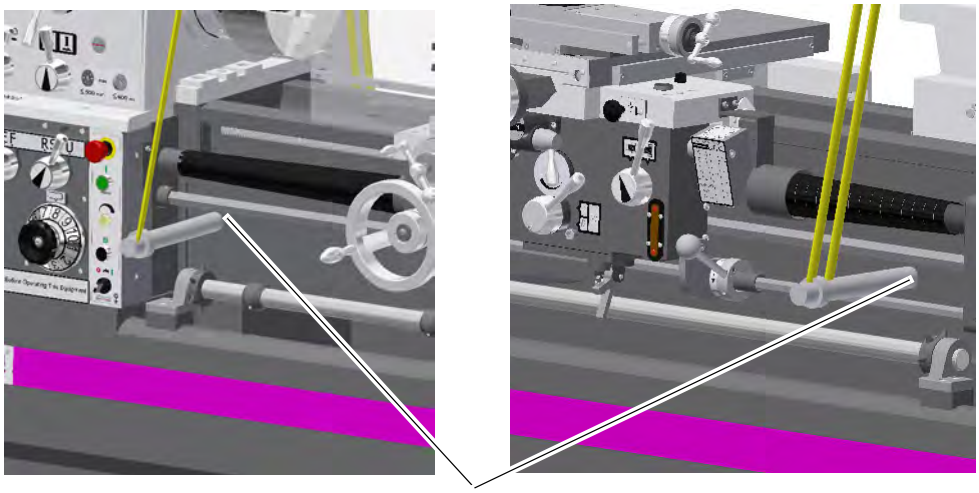


3.4.1 Load suspension point

ATTENTION!

Damage, bending of the lead screw and feed rod or selector shaft by the lifting slings.

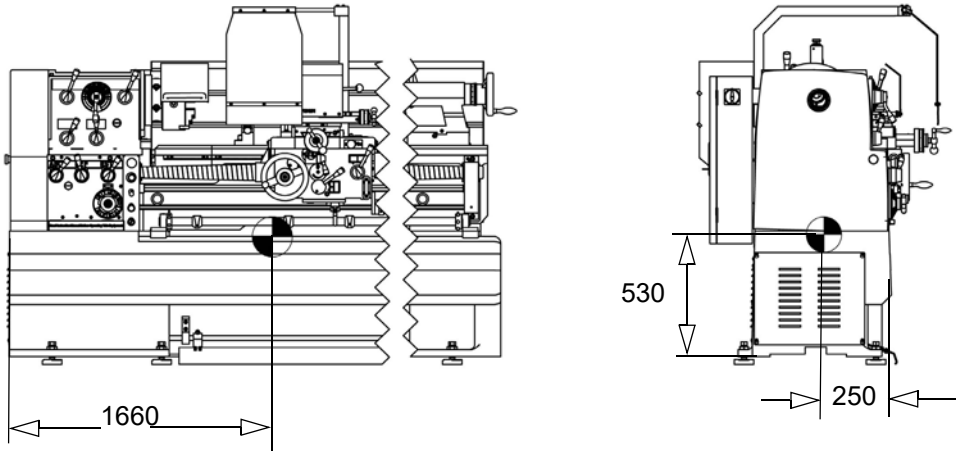
Make sure that the lead screw, the feed rod and the selector shaft of the lathe do not touch the lifting slings during lifting.



Drill hole in the machine bed for the load suspension

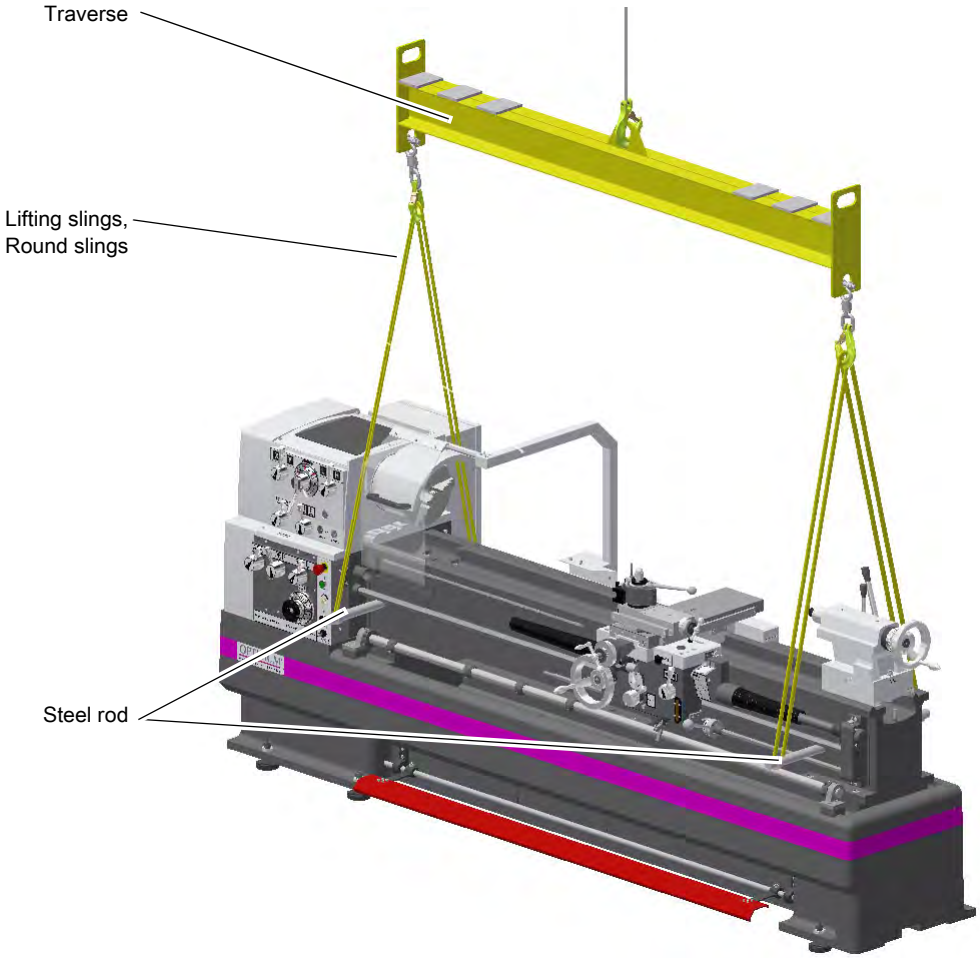
Img.3-1: Drill hole for the load suspension

3.4.2 Gravity of the machine



3.4.3 Lifting by crane

Weight of the lathe „ Weight [kg]“ on page 22



→ Disassemble the splashguard on the lathe.

→ Insert a steel rod with 35mm diameter and a length of about 800mm into the drill hole in the lathe bed.

→ Suspend a lifting sling to each of the two sides of the machine bed and to the ends of the piece of steel. Secure the lifting slings on the steel rods with clamping rings to prevent slipping.

→ Firmly clamp the tailstock.

→ Slowly raise the machine using the crane.

3.4.4 Lifting with a forklift

Weight of the lathe ► „ Weight [kg]“ on page 22

It is recommended that the lathe is transported on the lower portion of the packing crate. Disassemble the lateral parts of the packing crate.

Optional transport using a fork-lift truck:

→ Disassemble the splashboard on the lathe.

→ Lift the lathe using the jack screws until the forks of the forklift fit under the machine bed.

→ Lift the lathe from the back with a forklift.

3.5 Installation and assembly

ATTENTION!

Before you install the machine have the load-bearing capacity of the floor checked by an expert. The floor or ceiling of the hall must carry the weight of the machine plus any additional parts and auxiliary equipment, as well as operator and stockpiled materials. If necessary, the floor must be strengthened.

3.5.1 Requirements regarding the installation site

To achieve sufficient security against falls by slipping, the accessible area must be provided in the machining area of the machine with a slip resistance.

The anti-slip mat and / or the anti-slip flooring must be at least according German BGR 181 R11. The shoes used must be suitable for use in these processing areas. The pedestrian areas must be cleaned.

Organize the working area around the lathe according to the local safety regulations. ► Work area on page 22

The working area for operating, maintenance and repair must not be restricted.

INFORMATION

In order to attain good functionality and a high processing accuracy as well as a long service life of the machine, the place of installation should fulfil certain criteria.

Please observe the following points:

- The machine must only be installed and operated in a dry and well-ventilated place.
- Avoid places near machines generating chips or dust.
- The installation site must be free from vibrations also at a distance of presses, planing machines, etc.
- The ground must be suitable for the lathe. Make sure that the floor has sufficient load-bearing capacity and is level.
- The ground must be prepared in a way that potential coolants cannot penetrate the floor.
- Any parts sticking out such as stops, handles, etc. have to be secured by measures taken by the customer if necessary in order to avoid endangering persons.
- Provide sufficient space for the personnel preparing and operating the machine and transporting the material.
- Also make sure the machine is accessible for setting and maintenance works.
- Provide for sufficient backlight (Minimum value: 500 lux, measured at the tool tip). At lower illumination intensities, additional illumination has to be ensured e.g. by means of a separate workplace lamp.

INFORMATION

The main switch of the lathe must be freely accessible.

3.6 Cleaning of the machine

CAUTION!

Do not use compressed air to clean the machine.

Your new lathe must be completely cleaned after being unpacked to make sure that all the moving parts and sliding surfaces are not damaged when the machine is operated. Each unit leaves the factory with all its polished parts and sliding surfaces suitably greased to avoid oxidation in the period of time that elapses, until it is started up. Remove all the wrapping and clean all the surfaces with a degreaser to soften and remove the protecting greases and coatings.

Clean all the surfaces with a clean cotton cloth and lubricate the lathe as explained in the following section, before connecting the power and beginning to operate the machine.

3.6.1 Lubrication

The lubrication and initial greasing of your new lathe consists of checking the oil levels through the headstock, apron and feed box oil sight glasses. The oil tanks must be filled to half way up the sight glass. Once these operations have been carried out, the machine can be started up.

→ The headstock, feed box and apron oil must be changed 50 hours after being filled for the first time, then after every 1000 hours of operation.

► Feed gear on page 81

► Apron on page 82

► Headstock on page 83

→ Use the oil types recommended in the reference table ► Operating material on page 22. This table can be used to compare the characteristics of each different type of oil of your choice.

→ The lubrication nipples must be lubricated every 8 hours using an oiler. Furthermore, it is also recommended to lubricate the slide tracks of the machine bed once a day.

ATTENTION!

Every week, check the manual lubrication pump unit for proper functionality and ensure sufficient oil is reaching all slideways.

3.7 Assembly

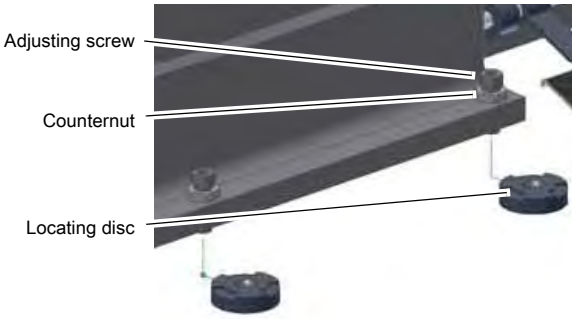
3.7.1 Anchor-free assembly

→ Insert the locating discs included in the scope of delivery under the lathe substructure.

→ Align the lathe with a machine spirit level.

❍ Check the alignment of the machine after a few days of usage.

→ Use the adjusting screws to adjust the lathe.



Img. 3-2: Adjusting screw

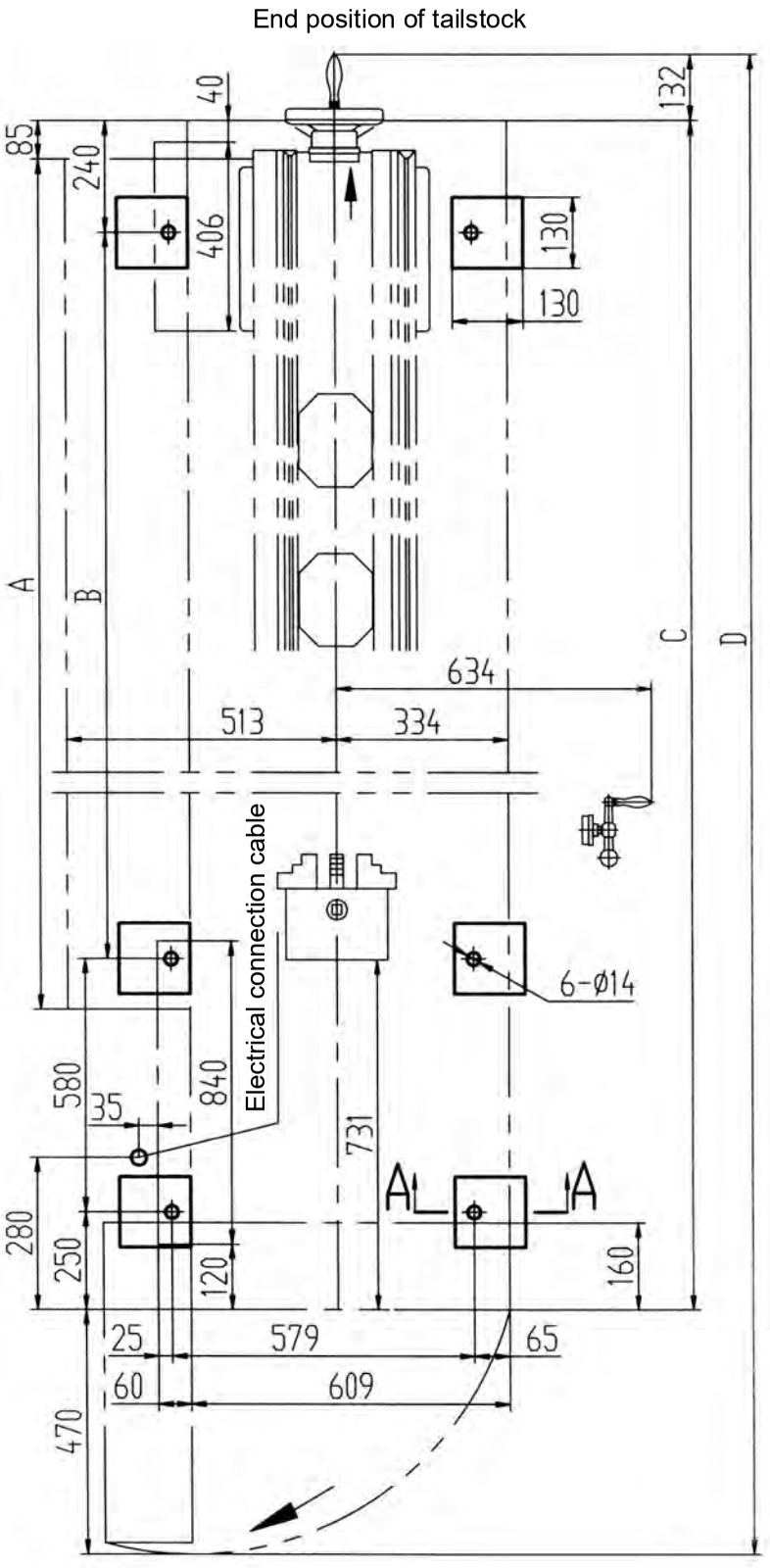
ATTENTION!

Insufficient rigidity of the ground leads to superposition of vibrations between the lathe and the ground (natural frequency of the components). Critical speeds with unpleasant vibrations are rapidly achieved if the rigidity of the whole system is insufficient; this will lead to bad turning results.

3.7.2 Anchored assembly

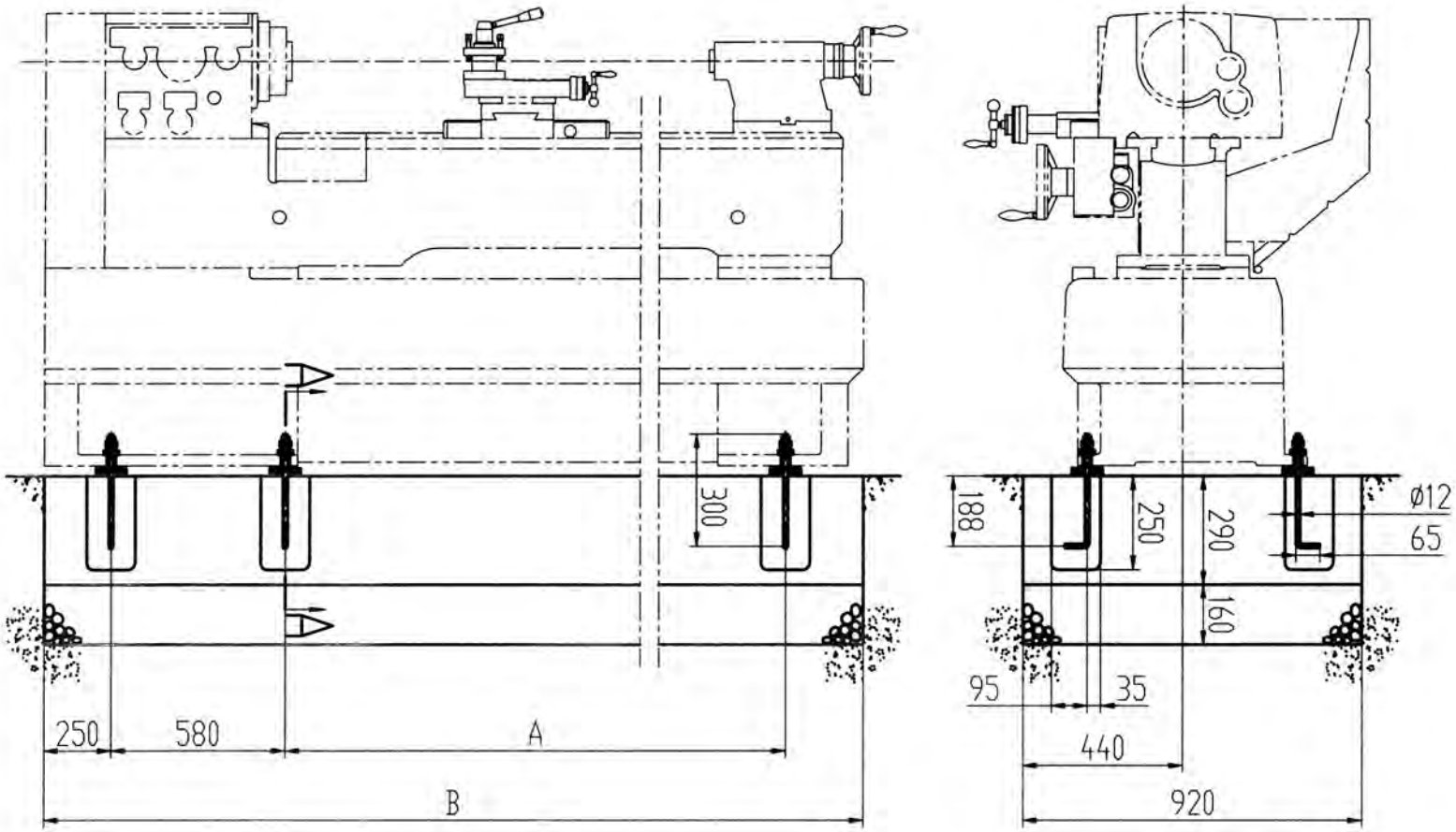
Use the anchored assembly in order to attain a firm connection to the ground. An anchored assembly is always reasonable if parts are manufactured to the maximum capacity of the lathe.

3.8 Installation plan



	A	B	C	D
TH5615	2105	1746	2816	3418
TH5620 TH5620V	2605	2246	3316	3918

3.8.1 Anchored assembly



	TH5615	TH5620 TH5620V
A	1746	2246
B	2816	3316

TH5620V_GB_3.fm

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3.8.2 Coolant equipment

The lathe is equipped with an external coolant tank. The external coolant tank allows for easier handling, monitoring and exchange of the coolant.

CAUTION!

Please read the notes on the required properties of the cooling lubricant to be used and the inspection interval.

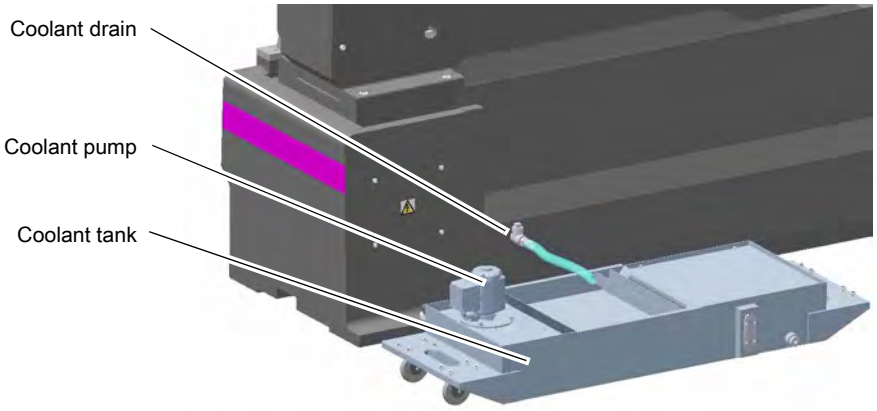
- ► **Cooling lubricant on page 57**
- ► **Cooling lubricants and tanks on page 88**

→ Mount the coolant pump on the coolant tank using the attached fastening material.

→ Mount the drain of coolant into the holding fixture. Attach the hose with the supplied hose clamp.

→ Fill in coolant.

O Filling quantity ► Operating material on page 22.



Img. 3-3: Coolant equipment

ATTENTION!

Destruction of the pump due dry running. The pump is lubricated by the cooling agent. Do not operate the pump without coolant.

3.9 First commissioning

WARNING!

The machine may only be commissioned after proper installation.

There is a danger to persons and equipment, if the first commissioning carried out by inexperienced personnel. We do not accept any liability for damages caused by incorrectly performed commissioning.

ATTENTION!

Before initially operating the machine, check all screws, fixtures and/or safety devices and tighten up the screws if necessary!

WARNING!

Risk from using improper workpiece clamping materials or operating the machine at an inadmissible speed.

Only use the tool clamping devices (e.g. lathe chuck) that were delivered with the machine or those offered by OPTIMUM as optional equipment.

Only use tool clamping devices in the intended admissible speed range.

3.10 Warming up the machine

ATTENTION!

If the lathe and in particular the lathe spindle are immediately operated at maximum load when cold, this may result in damages.

If the machine is cold, e.g. directly after having transported the machine, it should be warmed up at a spindle speed of only 500 1/min for the first 30 minutes.

3.11 Functional check

→ Check if all spindles are running smoothly.

3.12 Electrical connection

WARNING!

Danger to life caused by high leakage currents for an interrupted protective conductor.

The drive components conduct a high leakage current via the protective conductor.

Touching conductive parts when the protective conductor is interrupted can result in death or serious injury.

Lay the protective conductor as specified.

→ Check the fusing (fuse) of your electrical supply according to the technical instructions regarding the total connected power of the lathe.

→ Firmly connect the machine.

ATTENTION!

Ensure that all 3 phases (L1, L2, L3) and the ground wire are connected correctly.

The neutral conductor (N) of its power supply is not connected.

ATTENTION!

Make sure that the direction of rotation of the drive motor and cooling lubricant pump is correct. If the rotational direction switch is switched to the down position, the lathe spindle must rotate anticlockwise. If necessary, exchange two phase connections. The guarantee will become null and void if the machine is connected incorrectly.

3.12.1 Electrical connection TH5620V

The lathe TH5620V is designed for TN and TT line systems with a grounded neutral point.

Prohibited operation

Operation on TN line systems with grounded external conductors is prohibited.

Operation on TT line systems without grounded neutral points is prohibited.

Operation on IT line systems is not permitted. In an IT line system, all of the conductors are insulated with respect to the PE protective conductor – or connected to the PE protective conductor through an impedance. Operation on an IT line system is not permitted.

Permissible line supplies

Operation on TN and TT line systems

TN line system

The TN line system in accordance with IEC 60364-1 (2005) transmits the PE conductor to the installation via a conductor. Generally, in a TN line system the neutral point is grounded There are versions of a TN line supply with a grounded line the conductor, e.g. with grounded L1.

A TN line system can transfer the neutral conductor N and the PE protective conductor either separately or combined.

TT system

In a TT line system, the transformer grounding and the installation grounding are independent of one another. There are TT line supplies where the neutral conductor N is either transferred – or not.

3.12.2 Regulated drives in connection with residual current devices

Speed-controlled drives are one of the standard equipment in machine and plant construction and perform various tasks. Compared to a simple motor, the electronic rectifiers or converters require some special features for the necessary safety measures for electrical safety. Depending on the application, the use of a fault current protection device, differential current monitoring or insulation monitoring can make more sense.

For electrical safety, DIN VDE 0100-410 (VDE 0100 part 410): 1997-01 "Erection of heavy current installations up to 1000V" is a basic standard. It describes both, the admissible net forms and the necessary protective measures against dangerous body currents. Based on this standard DIN EN 50178 (VDE 0160): 1998-04 "Equipping of heavy current systems with electronic equipment" specifies the protective measures to be applied to controlled drives in more detail. It calls for: "In the case of electronic equipment, the protection of persons against dangerous body currents must be carried out in such a way that a single fault does not cause any danger."

Regulated drives with residual current devices

The TN-S system is the most common network form for the operation of controlled drives. This is done, among other things, for EMV reasons and to avoid vagabonding currents. In accordance with DIN VDE 0100-410 (VDE 0100-410): 1997-01, fault current protective devices (ELCB) can be used as a protective measure against dangerous body currents. According to DIN VDE 0100-482 (VDE 0100 part 482): 2003-06 "Electrical installations of buildings", cables and wiring systems in fire-endangered plants must be protected by ELCBs with a rated differential current of 300 mA. According to IEC 60755, ELCBs differ in the type of fault currents they can detect. In conjunction with electronic devices currents with DC components may occur.

3.12.3 Protection from Dangerous Shock Currents, use of ELCBs

To achieve increased safety in all installation systems, and in power supply ranges for which the installation provisions stipulate or recommend the ELCB devices.

Measure for “Protection from Dangerous Shock Currents”, as regulated in DIN VDE 0100 Part 410. All measures are to be mentioned:

- Protection from indirect contact – as protection against fault by shutting down in the event of inadmissibly high contact voltage by short circuit shock on the operating resource.
- Protection from direct contact – as additional protection by shutting down in the event of contact with a live conductor. Dangerous shock currents are shut down within the shortest possible time, if the rated fault current of the circuit breaker is 30 mA (e.g. Domestic environment), for a personal protection system 10 mA (e.g Bathroom).
- Fire prevention – Prevention of the origination of electrically-ignited fires if the rated fault current of the circuit breaker is 300 mA. Operating premises at risk of fire to VdS 2033: 2002-02 300 mA (e.g. Factory halls).

3.12.4 Current in the protective earth conductor - Leakage current

With EMC filters in frequency converters, the leakage current is always greater than 3.5 mA due to physics. Some types of frequency converters also achieve a leakage current of up to 300mA.

Therefore, a fixed earth connection is required and the minimum cross section of the protective earthing conductor must conform to local safety regulations for devices with high leakage current. This is achieved by providing a permanent fixed earthing connection with two independent conductors, each having a cross section the same as the power supply cord or greater.

Preferably, machines with frequency converters are therefore to be permanently connected to a terminal box, otherwise an additional fixed earth connection is required, which is not routed over the plug, and must correspond to at least the cross-section of the cable in the plug.

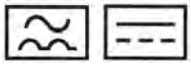
Since a direct current may be caused by the frequency converter in the protective earthing conductor, if an upstream residual current device (ELCB / RCD) is required in the network, the following guidelines must be followed:

To avoid an operating fault, you need an AC/DC-sensitive ELCB. Be absolutely sure which leakage current security is necessary for dangerous body currents, as regulated in DIN VDE 0100 part 410, at your mains connection.

3.12.5 When the ELCB triggers

- Pulse current - sensitive ELCB type A
  ELCB type A independent of rated voltage, for triggering when changing fault currents and pulsing DC fault currents.

- AC/DC - sensitive ELCB type B
  ELCBs of series type B also accept the detection of smooth AC fault currents as well as the detection of fault current shapes of type A; they are therefore suitable for all the circuits mentioned. ELCBs of this series therefore detect all types of fault current according to the triggering characteristic B, i.e. both smooth DC fault currents and also all AC fault currents of all frequencies and mixed frequencies up to 1 MHz are detected and switched off reliably in the event of a fault.



- Alternating current - sensitive ELCBs of type AC (only alternating current) are unsuitable for frequency converters. Alternating current - sensitive ELCBs of type AC are not customarily used and are no longer permitted in Germany.

Type B must be used with 3-phase converters.

When using an external EMC filter, to avoid false error shutdowns, a time delay of at least 50 ms is required. The leakage current can exceed the threshold trigger value for an error shutdown if the phases are not switched on at the same time.

3.13 Power grid fluctuations and their destructive effect

A prerequisite for grid stability is that the frequency and voltage are within the specified limits at every location in the power grid and at all times. Excessive deviations in voltage can only be remedied locally, i.e. by nearby plants, while frequency deviations must be reacted to very quickly in particular. These measures to maintain grid stability are called system services of your supplier.

Lightning as a cause of voltage peaks

Thunderstorms, and the associated risk of lightning strikes, are one of the main causes of voltage peaks in electrotechnical installations. About 1.5 to 2 million lightning strikes per year are registered in Germany alone, and the damage is considerable. Destroyed equipment, damaged operating and data technology, failure of installations.

Switching of inductive loads

Switching inductive loads, supply company interference suppression and other problems also often damage data or systems.

Renewable energies

Renewable energies located in a local environment can trigger voltage fluctuations if the electricity grid operator is already operating the grid at the upper limit in order to be able to supply as much electricity as possible.

Detecting voltage peaks

In an electrical system, voltage peaks can be displayed with an oscilloscope or a mains analysis device; voltage peaks are thus made visible during long-term measurements. Measurements can also be made with a pulse counter, which records voltage peaks from a set threshold value using a measuring transformer. However, the significance of such measurements should be treated with caution. It is true that voltage peaks can be detected and can also be used for risk assessment. However, it is not the frequency of the voltage peaks that is decisive, but the destructive energy they contain. And a single impulse is enough to completely destroy a device.

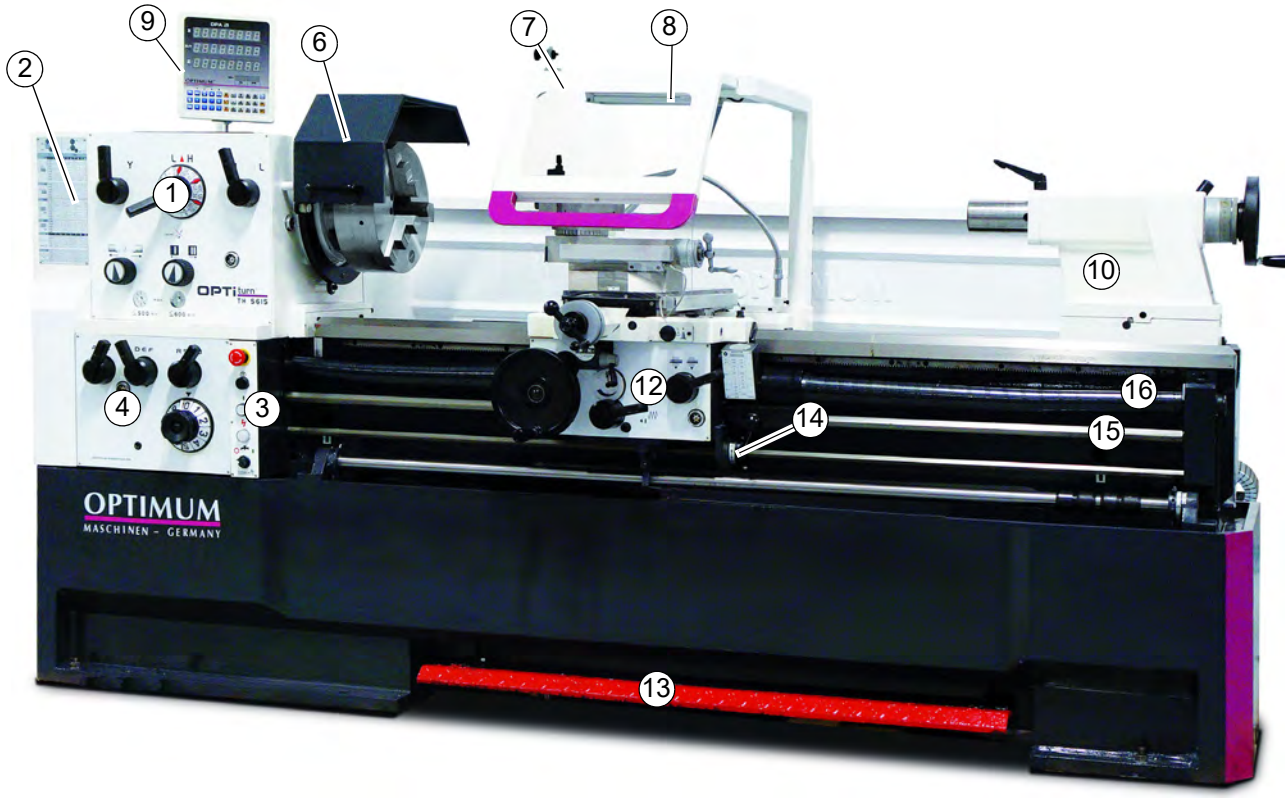
Detect and prevent over voltage

Impending over voltage damage must be recognised by a specialist and prevented by means of protection in the electrical system. Surge protection devices protect against short-term voltage peaks - so-called transients. Special TOV (Temporary Over Voltage) protection devices protect against temporary or permanent over voltages.

Voltage peaks with interference potential occur in every electrical system. Surges due to switching operations occur more frequently than lightning couplings. Voltage peaks can be detected by measurements, but only precautionary measures using a surge protection concept ensure the required high availability of an electrical system.

4 Operation

4.1 Control and indicating elements



Pos.	Designation	Pos.	Designation
1	Selector lever speed adjustment	2	Change wheel and infeed table
3	Control panel	4	Selector lever feed gear
6	Lathe chuck protection	7	Chip shield
8	Machine luminaire	9	Digital position display
10	Tailstock	13	Mechanical spindle brake (emergency stop)
12	Control panel lathe saddle	15	Feed rod
14	Switch lever spindle rotational direction	16	Lead screw

4.2 Safety

Commission the lathe only under the following conditions:

- The lathe is in proper working order.
- The lathe is used as prescribed.
- The operating manual is followed.
- All safety devices are installed and activated.

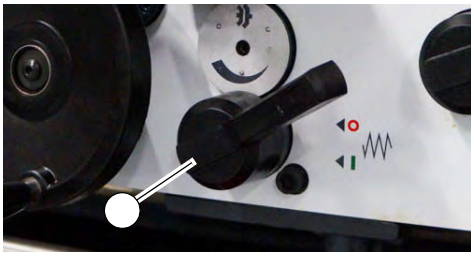
Eliminate or have all malfunctions rectified promptly. Stop the lathe immediately in the event of any abnormality in operation and make sure it cannot be started-up accidentally or without authorisation. Notify the person responsible immediately of any modification.

► Safety during operation on page 18

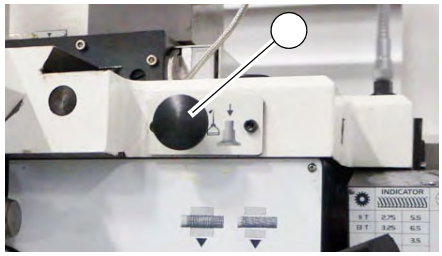
4.2.1 Overview of the control elements

lockable main switch

Feed direction (1)
Infeed speed (2)



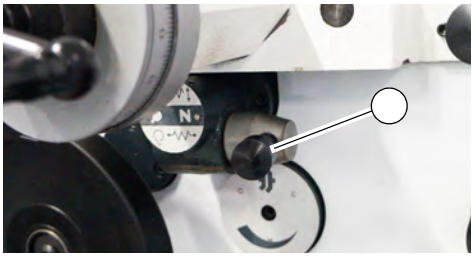
ON-lever cut-off for longitudinal feed



Pump central lubrication

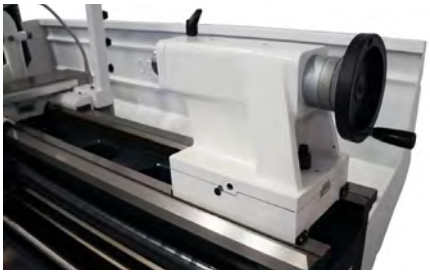
Threading engaging lever

Actuating lever rotational direction

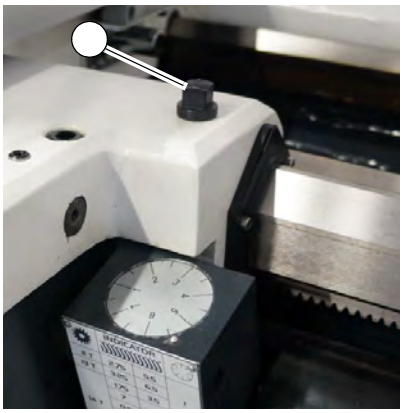


Cross feed / longitudinal feed engaging lever

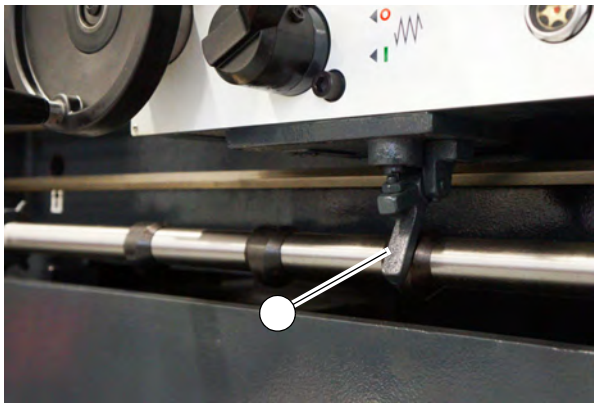
Quick action tool holder



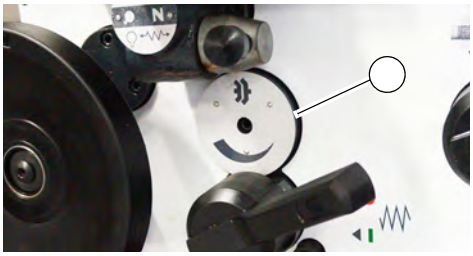
Tailstock



Attachment screw lathe saddle



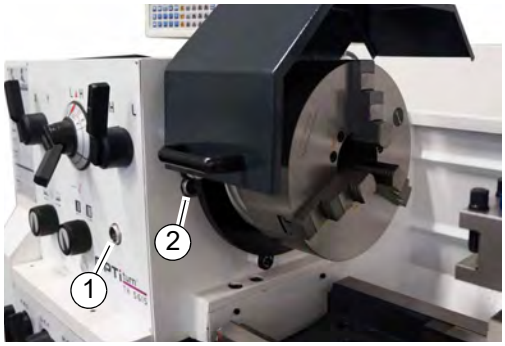
Mechanical cut-off for longitudinal feed lathe saddle



Setting the clutch of the feed

4.2.2 Display elements overview

Oil sight glass apron



Oil sight glass spindle stock (1)
Oil supply front spindle bearings (2)

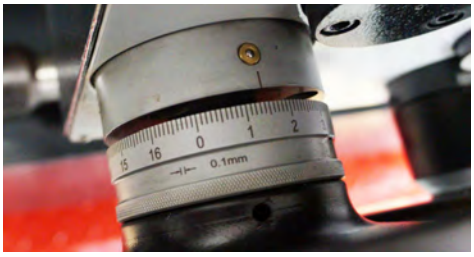
Oil sight glass feed gear

Scale cross offset tailstock

Scale on the handwheel cross slide

Scale on the handwheel top slide

Scale on the handwheel tailstock



Scale on the handwheel bed slide

4.2.3 Control elements

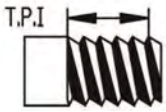
H

high speed range

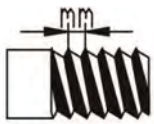
L

low speed range

Longitudinal feed / cross feed



Inch thread
[threads / inch]



Metric thread
[mm / spindle revolution]

mm per spindle revolution

Modular thread / diametrically thread

Feed direction

Refill oil

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Check filling level

The maximum rotational speed must not be exceeded!

Read the maintenance manual

► Checkup, inspection and maintenance on page 79

Direct run

Coolant On / Off

4.3 Switching on the machine

→ Switch on the main switch.

→ Check that the emergency stop switch is not pressed or unlocked. Turn the emergency stop switch to the right in order to unlock it.

→ Press the "Reset" key to switch on the controls, the operation control light must be lit.

→ Close the lathe chuck protection.

→ Press the momentary switch "direct run". The spindle moves (jerks) briefly.

→ Press the "Reset" button again. The fail-safe function of the frequency converter is now guaranteed for next 8 h. ► Monitoring the fail-safe functions of the frequency converter on page 44

4.4 Switching off the machine

→ Switch off the main switch.

→ If the lathe has been shut off for a longer period of time, switch it off using the main switch and secure it against being unintentionally switched back on. ► Disconnecting and securing the lathe on page 19

CAUTION!

The emergency stop mushroom switch may only be activated in an emergency. A normal shut-down of the machine must not be executed using the emergency stop switch.

4.5 Resetting an emergency stop condition

→ Set the rotational direction control lever to the neutral position.

→ Unlock the emergency stop switch again.

→ Switch the control on.

4.6 Power failure, Restoring readiness for operation

→ Set the rotational direction control lever to the neutral position.

→ Switch the control on.

4.7 Direct run

Use the direct run to facilitate engaging the gearbox settings. The spindle starts turning, while the direct run is activated. The lathe chuck protection must be closed for this. Press the button direct run only short.

4.8 Foot brake

Activating the foot brake deactivates the drive and brakes the spindle.

→ Set the lever of rotational direction back to the neutral position.

4.9 Gearbox settings and speed adjustment

ATTENTION!

Change the speed levels and gearbox settings only when the machine is at a standstill or at a speed of less than 500min^{-1}

4.9.1 Speed setting

DANGER!

Please observe the maximum permissible rotational speed when using a face plate and the maximum permissible speed when using chucks with individually clampable jaws.

o The maximum rotational speed of the face plate is 500 rpm.

INFORMATION

The face plate and four-jaw lathe chuck have individually clampable jaws. The individually clampable jaws on these tool carriers are constructive not designed to withstand high centrifugal forces. The centrifugal forces on the clamping jaws increases almost quadratically with increasing rotational speed. Clamping jaws may burst and be hurled out of the workpiece carrier at a high speed.

ATTENTION!

Change the speed levels and gearbox settings only when the machine is at a standstill or at a speed of less than 500min^{-1}

There are 2 speed ranges available.

25 min^{-1} - 200 min^{-1}

200min^{-1} - 1600 min^{-1}

4.9.2 Monitoring the fail-safe functions of the frequency converter

INFORMATION

The "ON + RESET" push button control must be pressed again after a period of 8 hours. The elapsed time of 8 hours is noticeable by "jerking" when starting the spindle.

→ Press the button "RESET".

Thus, the safety functions of the frequency converter to be checked and confirmed again. For more information, see the Function Manual Siemens SINAMICS G120 - Monitoring the fail-safe functions.

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4.10 Turning direction

The rotation of lathe is switched using the control lever. The lathe can only be switched on, when the lathe chuck protection is closed.

→ Turn the control lever down if you want the turning direction to be anti-clockwise.

→ Turn the control lever up if you want the turning direction to be clockwise.

ATTENTION!

Wait until the lathe has come to a complete halt before changing the rotational direction by turning the actuating lever rotational direction. Use the spindle break to slow down the lathe more quickly.

A change of direction of rotation during operation leads to the destruction of components.

4.11 Feed

The selector levers are used to set the feed or the pitch required for thread cutting.

ATTENTION!

Only adjust the speed when the lathe is being completely stopped. If required, use the direct run to facilitate the engaging of the gear lever.

ATTENTION!

Damage to couplings, mechanical parts. The automatic feed is not designed to move onto mechanical stops or the mechanical end of the headstock.

4.11.1 Infeed speed

Use the table on the lathe to adjust the rate of feed. ► Setting the feed on page 50

4.11.2 Feed direction

The selection lever is used to change the feed direction.

→ Turn the selector lever up and down according to the symbols for production of longitudinal feed in direction of the spindle head or for production of a right-hand thread.

4.12 Quick action tool holder

Clamp the lathe tool into the quick action tool holder.

The lathe tool needs to be clamped as short and tight as possible when turning in order to be able to absorb the cutting force during the chip formation well and reliably.

Adjust the height of the lathe tool by means of the set screw on the tool holder. Counter the position of the tool holder by means of the knurled nut. Use the tailstock with the centring point in order to determine the required height. After having set the height, firmly tighten the quick action tool holder using the locking lever.

Tool height

For the facing process, the cutting edge of the tool must be exactly aligned with the height of the lathe centre to obtain a shoulder-free face. The facing process is a turning operation in which the turning tool feeds perpendicular to the axis of rotation of the workpiece in order to produce a flat surface. The different methods are
transversal facing, transversal slicing and longitudinal facing.

Lathe tool angle

ATTENTION!

The lathe tool must be clamped with its axis perpendicular to the axis of the workpiece. If it is clamped at an angle, the lathe tool may be sucked into the workpiece.

4.13 Lathe spindle fixture

WARNING!

Do not clamp any workpieces that exceed the permitted chucking capacity of the lathe chuck. The clamping force of the chuck is too low if its capacity is being exceeded. The clamping jaws may loosen.

Only use lathe chucks designed for the speed of the machine.

Do not use lathe chucks with an external diameter that is too large.

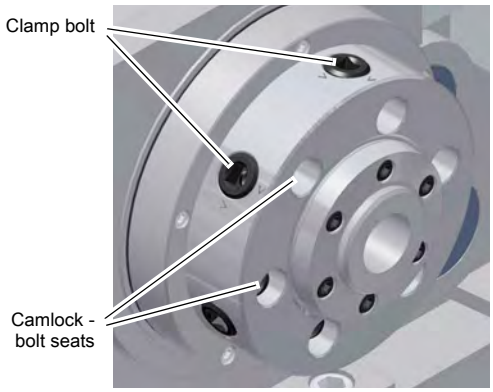
Please ensure that lathe chucks are manufactured to EN 1550 standards.

The spindle nose is designed as a Camlock ASA D 1-8" holding fixture.

Fasten workpiece holder

CAUTION!

If the reference mark on the clamp bolt is not between the two V markings, the chuck must be removed and this bolt (D) must be re-adjusted.



Img.4-1: Lathe spindle fixture

→ Fasten the workpiece holder by turning the clamping bolts clockwise.

The right clamp position is reached when the reference marker at the clamp holder are between the two marks at the lead spindle seat.

The tightening torque must be approximately 80 Nm, otherwise the rotational accuracy of the lathe chuck is not present. 100 Nm is about the torque used for aluminum rims on cars.

Img.4-2: Cam-lock clamping bolt markers

4.13.1 Adjusting the Camlock bolts to the workpiece holder

Insert all of the bolts in the screwed flange of the chuck, until the reference mark, the circular reference line (F) is in line with the wall of the chuck flange surface and the semicircular grooves are in line with the holes of the safety screw (E).

→ Fit the safety screw (E) into each bolt and tighten.

→ Make sure that the two contact sides (plate and shaft) are free from impurities.

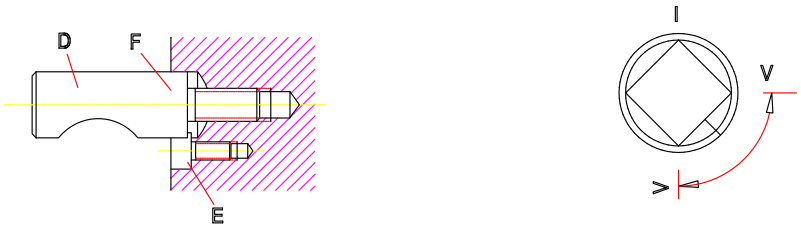
Now the chuck can be mounted.

Before coupling the chuck to the shaft nose, check that the clamp bolts are in an unlocked position.

→ Fasten the workpiece holder by turning the clamping bolts clockwise.

INFORMATION

The reference mark (F) on each Cam-lock bolt serves as an orientation for the correct adjustment.



Img. 4-3: Cam-lock fixture

4.14 Lathe chuck

During turning, the workpiece is subject to cutting forces, weight forces and unbalance forces which have to be absorbed by a sufficiently strong clamping force. Massive workpieces with higher degrees of stiffness lead to a considerable loss of clamping force. This loss of clamping force is lower for thin-walled, distortion-sensitive workpieces with less stiffness.

The maximum rotational speed of a lathe chuck may only be applied at maximum actuating force and with perfectly working chucks.

Lathe chucks must be designed for the maximum rotational speed of the machine, the permissible lathe chuck speed with respective jaws and/or top jaws, as well as the maximum measured static clamping force at maximum introduced force must be specified in the operating instructions for the lathe chuck or be indicated on the lathe chuck itself. Lathe chucks must comply with EN 1550 standards. The minimum distance to the machine bed must not be less than 25 mm.

WARNING!

Do not clamp any workpieces that exceed the permitted chucking capacity of the lathe chuck. The clamping force of the chuck is too low if its capacity is being exceeded. The clamping jaws may loosen.

Only use lathe chucks designed for the speed of the machine.

Do not use lathe chucks with an external diameter that is too large.

Please ensure that lathe chucks are manufactured to EN 1550 standards.

4.14.1 Lathe chuck speed information, maintenance recommendations, reference speed

in accordance with DIN 6386

The reference speed is the number of rotations, at which the mathematical centrifugal force with the corresponding jaw design correlates with the greatest tensioning force when the machine is at a standstill. The reference speed applies for jaws mounted inside in tiers, whereby they must not protrude past the outer diameter of the chuck.

At the determined reference speed, 1/3 of the tensioning force which is available when the machine is at a standstill, is available for clamping the workpiece. The prerequisite is that the clamping chuck is in proper working order.

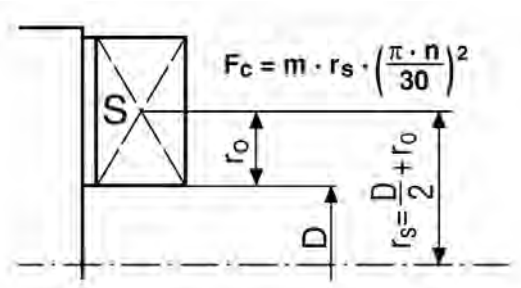
In general, the labels on the clamping jaws and lathe chuck (perm. speed, max. turning diameter, ...), the information in the respective lathe chuck operating instructions and, for special jaws, the additional information on the respective drawing must be observed.

The lathe chucks included in the scope of delivery cannot be used with top jaws.

4.14.2 Influencing factors that significantly impact the tensioning force

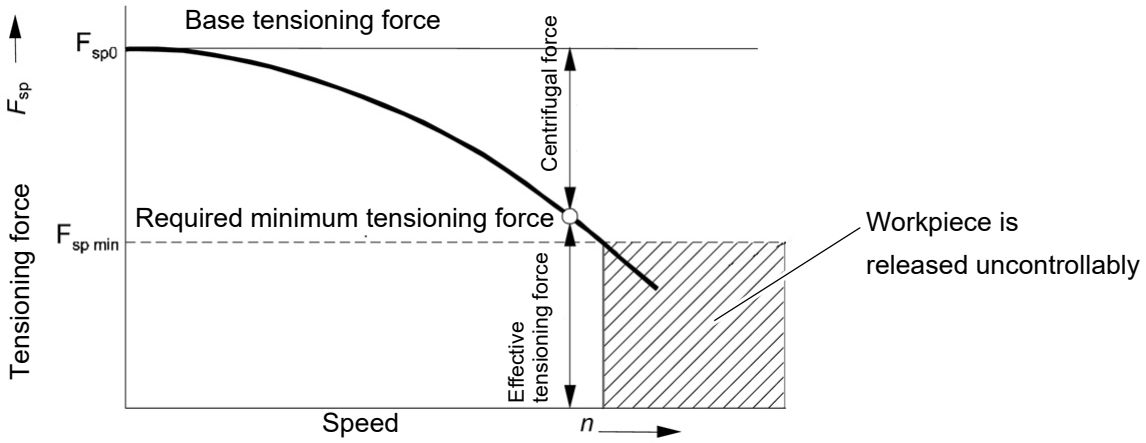
Clamping jaw centrifugal force

To calculate the required tensioning force for processing a workpiece, the centrifugal force of the clamping jaws must be taken into account.



Fc	Centrifugal force in N
m	Mass in kg/set
rs	Centre of gravity distance to the centre of the chuck in metres
n	Speed min^{-1}
r_0	Centre of gravity distance to the clamping jaw

The permissible speeds can be determined in accordance with VDI Guideline 3106 "Determining the permissible speed for lathe chucks (jaw chucks). This guideline also allows for the residual tensioning force at a specified speed to be determined.



4.14.3 Lathe chuck maintenance

A crucial prerequisite for fault-free functionality of a lathe chuck is regular and thorough lubrication of the sliding surfaces. This prevents the reduction of tensioning force and premature wear and tear.

Always observe the manufacturer's maintenance instructions when using replacement lathe chucks.

Coolant squirts on the lathe chuck and removes the grease from the jaws. In order to maintain the tensioning force and the long-term accuracy of the lathe chuck, the lathe chuck must be lubricated regularly. Insufficient lubrication will result in malfunctions with significantly reduced tensioning force, which affects the accuracy and causes excessive wear and seizing.

Lubricate the installed lathe chuck at least once per week. The used lubricant should be of high quality and provided for high pressure bearing surfaces. The lubricant should withstand the coolant and other chemicals.

Clamping jaws and jaw mounting screws are wear and tear parts. The service life is limited. We therefore recommend having them inspected at regular intervals by a specialist (e.g. inspection for cracks using a dye penetration process or magnet powder test (fluxing), eddy current testing, ultrasound testing) and replace if necessary.

4.14.4 Clamping long workpieces

o through the hollow shaft of the spindle

CAUTION!

Long rotating parts that protrude from the hollow shaft of the spindle must be secured by the operator using suitable covers. A cover can be a sleeve that is mounted on the headstock that, as a permanent safety device, completely covers the protruding workpiece.

o between the tips

CAUTION!

Long workpieces must be additionally supported. They are supported by the tailstock sleeve and, if necessary, a rest.

o with a lathe dog

CAUTION!

When clamping workpieces between the tips of the lathe while using a lathe dog, the existing lathe chuck protection must be replaced with a circular lathe chuck protection.

4.15 Mounting workpiece holder

DANGER!

Please observe the maximum permissible rotational speed of the supplied face plate.

o The maximum rotational speed of the face plate is 500 min^{-1}.

CAUTION!

When clamping workpieces or assembling heavyweight lathe chucks and rests, reasonable stress loads on the operator or assembler may be exceeded.

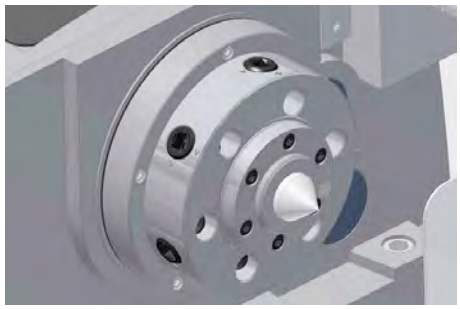
Recommended threshold values when lifting and carrying loads				
	Reasonable load in kg and frequency of lifting and carrying			
	Occasionally		More frequently	
Age in years	Women	Men	Women	Men
15 - 18	15	35	10	20
19 - 45	15	55	10	30
from 45	15	45	10	25

4.15.1 Centering point

→ Clean the taper bore of the lathe spindle holding fixture.

→ Clean the morse taper and the taper of the centring point.

→ Press the centring point with the morse taper into the taper bore of the lathe spindle holding fixture.



Img.4-4: Centering point

4.16 Mounting of rests

CAUTION!

The net weight of the fixed rest exceeds 35 kg.

► **Recommended threshold values when lifting and carrying loads on page 49**

4.16.1 Follow and steady rests

Use steady rest or follow rest to support longer parts and prevent the workpiece from flapping around and flying away.

4.17 Bed insert

Remove the bed insert if the diameter of the workpiece turned is larger. By removing the bed insert, the rotational diameter can be increased. The rotation length is limited.

→ First detach the fastening screws and then pull out the alignment pins.

→ For re-assembly, proceed the other way around.

4.18 Feed tables

4.18.1 Longitudinal turning and face turning

4.18.2 Setting the feed

Example: Feed 0.059 mm / spindle revolution

→ Step lever to position II

→ Set the selector lever to position C / F / T

→ Choose feed direction

→ Turn selector switch to position 1

→ Detach the clamping screw on the bed slide at longitudinal feed ► „Img.4-12: Lathe saddle tightening screw“ on page 56.

→ Activate the automatic cross feed by pulling up the lever.

→ Activate the automatic longitudinal feed by pulling out the lever to the right and then pushing it down.

→ Move the hand wheel of the corresponding slide to facilitate the locking of the engaging lever.

► Cutting speeds on page 76

4.18.3 Automatic cut-off for the longitudinal feed

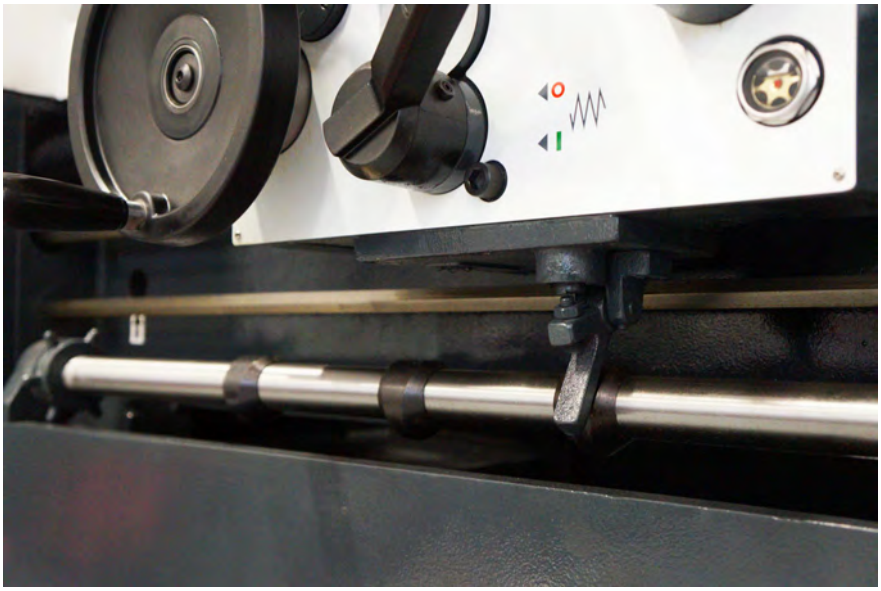
The lathe is equipped with an automatic cut-off for the longitudinal feed.

→ Position the respective cam to the required cut-off position.

→ Before starting the operation, check the actual cut-off position by switching on the automatic longitudinal feed without machining a workpiece.

ATTENTION!

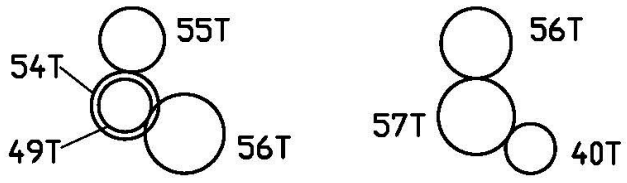
Never rely on adjusted cams. Before starting the operation, check the actual cut-off position. Follow the operating instructions of the lathe. ► **Safety during operation on page 18**



Img. 4-5: Mechanical longitudinal feed switch

4.19 Table for thread-cutting

Lead screw pitch = 6mm
Cross feed rod = 4mm



(V) (VV)

Meaning:

DP = Diametrical pitch

MP = Module pitch

(V V) and (V) = Change gear combination

T/1" = Number of **T**hreads per one inch

mm = metric pitch

	LEVER	1	2	3	4	5	6	7	8	9	10
(V) mm	II CFS	0.1						0.15			
	II CES	0.2			0.25			0.3			0.35
	II CDS	0.4	0.45		0.5	0.55		0.6	0.65		0.7
	II CEU							0.75			
	I CFS	0.8	0.9								
	II CDU	1			1.25			1.5			1.75
	I CFU	2	2.25		2.5	2.75		3	3.25		3.5
	I CEU	4	4.5		5	5.5		6	6.5		7
	I CDU	8	9		10	11		12	13		14
(V) T/"	II AER	64	72	76	80	88	92	96	104	108	112
	II AFR	32	36	38	40	44	46	48	52	54	56
	II BFR	16	18	19	20	22	23	24	26	27	28
	I AER	8	9	9 1/2	10	11	11 1/2	12	13	13 1/2	14
	I AFR	4	4 1/2	4 3/4	5	5 1/2	5 3/4	6	6 1/2	6 3/4	7
	I BFR	2	2 1/4	2 3/8	2 1/2	2 3/4	2 7/8	3	3 1/4	3 3/8	3 1/2
(VV) MP	II CES	0.1						0.15			
	II CDS	0.2			0.25			0.3			0.35
	I CFS	0.4	0.45		0.5	0.55		0.6	0.65		0.7
	II CDU							0.75			
	I CES	0.8	0.9								
	I CFU	1			1.25			1.5			1.75
	I CEU	2	2.25		2.5	2.75		3	3.25		3.5
	I CDU	4	4.5		5	5.5		6	6.5		7
(VV) DP	II AFR	64	72	76	80	88	92	96	104	108	112
	II BFR	32	36	38	40	44	46	48	52	54	56
	I AER	16	18	19	20	22	23	24	26	27	28
	I AFR	8	9	9 1/2	10	11	11 1/2	12	13	13 1/2	14
	I BFR	4	4 1/2	4 3/4	5	5 1/2	5 3/4	6	6 1/2	6 3/4	7

	LEVER	1	2	4	5	7	8	10
(V) mm/U	II CFT	0.031	0.034	0.038	0.041	0.045	0.049	0.053
	II CET	0.062	0.068	0.076	0.082	0.090	0.098	0.106
	II CDT	0.124	0.136	0.152	0.164	0.180	0.196	0.212
	I CFT	0.248	0.272	0.304	0.328	0.360	0.392	0.424
	I CET	0.496	0.544	0.608	0.656	0.720	0.784	0.848
	I CDT	0.992	1.088	1.216	1.312	1.440	1.568	1.700
mm/U (V)	II CFT	0.014	0.016	0.017	0.019	0.021	0.023	0.024
	II CET	0.028	0.031	0.035	0.038	0.042	0.045	0.049
	II CDT	0.056	0.062	0.070	0.077	0.084	0.091	0.098
	I CFT	0.112	0.125	0.140	0.154	0.168	0.182	0.196
	I CET	0.224	0.250	0.280	0.308	0.336	0.364	0.392
	I CDT	0.448	0.500	0.560	0.616	0.672	0.728	0.784

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4.19.1 Metric threads

Adjusting threads

Example: thread pitch 3 mm (M 24)

→ Use the change gear combination (V)
→ Turn selector lever to position I
→ Set the selector lever to position C / F / U
→ Choose feed direction
→ Turn selector switch to position 7
→ Loosen the clamping screw on the bed slide. ► „Img. 4-12: Lathe saddle tightening screw“ on page 56
→ Activate the automatic feed using the thread cutting engaging lever. Slightly move the hand wheel of the lathe saddle a little in order to facilitate the locking of the engaging lever.

4.19.2 Module and diametral threads

INFORMATION

The position of the change gear wheels must be changed for the production of module and diametral pitch.

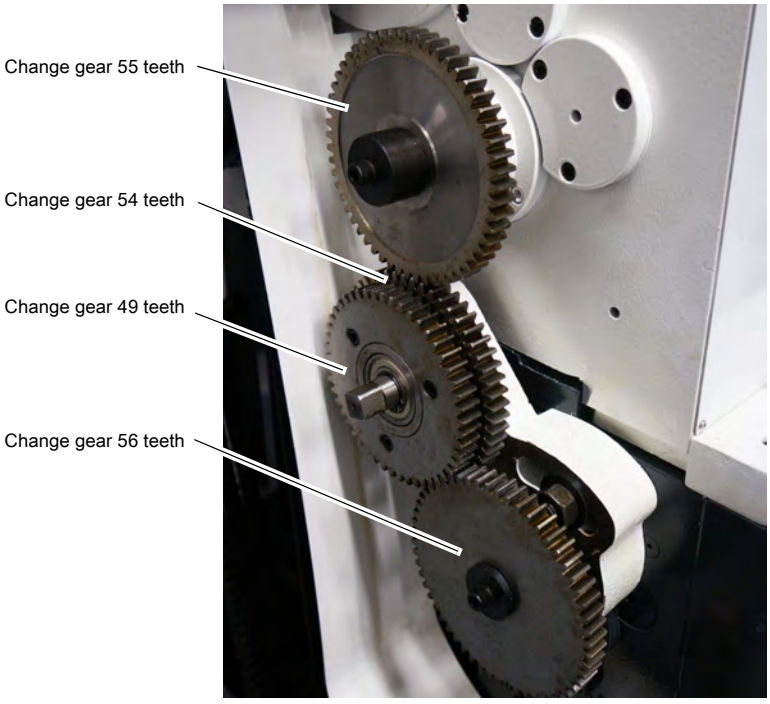
In countries where the Anglo-American system of measurement is used, its inverse is used as a "diametrical pitch" (D.P.) with the unit 1 inch instead of the module.

$$\text{Module} = \frac{25.4}{\text{D.P.}}$$

Exchange, change of position of the change gears

The change gears for the feed are mounted to a quadrant respectively directly on the lead screw.

→ Always disconnect the main plug of the lathe and secure the main switch by a padlock, against unauthorized or accidental activation.

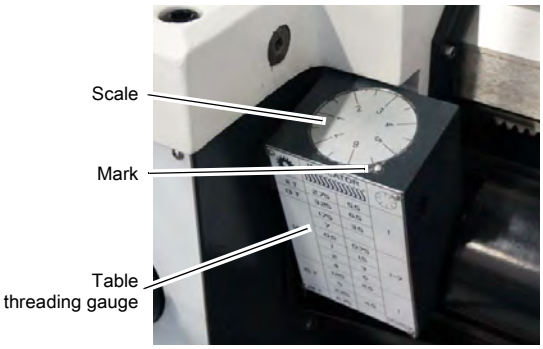


Img. 4-6: Change gear wheel position for metric threads and threads based on the inch-system

→ Loosen the clamping screw on the quadrant.
→ Mount the change gear wheel delivered with 40 teeth instead of the change gear wheel with 56 teeth.
→ Mount the change gear wheel delivered with 57 teeth instead of the change gear wheel with 54 and 49 teeth.
→ Mount the change gear wheel delivered with 56 teeth instead of the change gear wheel with 55 teeth.
→ Position the quadrant in a way that the change gear wheel with 56 , 57 and 40 teeth cam witheach other.
→ Re-mount the quadrant.

4.19.3 Threading gauge

The threading gauge is used to re-engage the lead-screw nut in connection with the thread cutting engaging lever with the lead screw at the right place when cutting threads.



Img.4-7: Threading gauge

ATTENTION!

Dismount or disengage the toothed wheel of the threading gauge when you are not cutting a thread. This considerably reduces the wear and tear on the toothed wheel.

→ Compare the thread to be cut with the indication in the table on the threading gauge.
→ Cam in the treading gauge with the lead screw. Tighten the clamping screw.
→ Only close the thread cutting engaging lever after a thread cutting cycle, when the figure corresponds with the mark according to the specification in the table of the threading gauge.

4.20 Tailstock

The tailstock sleeve is used to hold the tools (bits, centring points, etc.)

→ Clamp the required tool in the tailstock sleeve.
O Use the scale on the sleeve to re-adjust and / or adjust the tool.
→ Clamp the sleeve with the clamping lever.
❍ Use the hand wheel to move the sleeve back and forth.

The sleeve of the tailstock can a drill chuck used for the recording of drilling and countersinking tools are set.

INFORMATION

When using different tools, it can happen that you cannot start with the quill marking with scale value 0, because the tool is already ejected in this position by the expulsion flap. In such cases we recommend to start at a value of 10mm and to convert from here on.

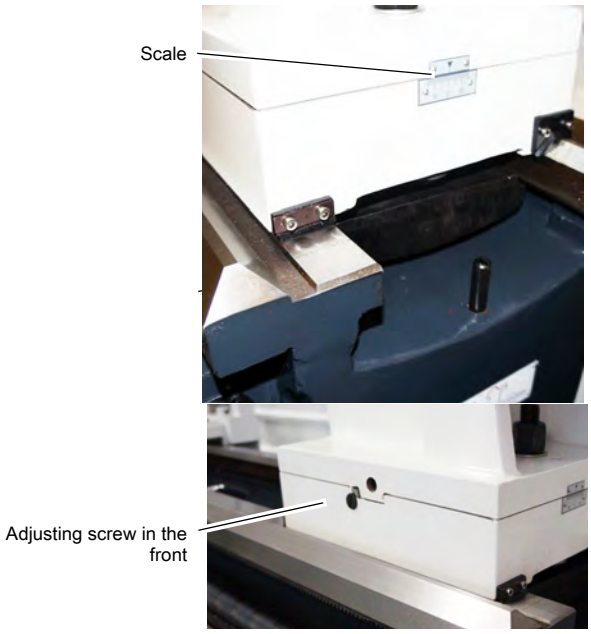
4.20.1 Cross-adjustment of the tailstock

The cross-adjustment of the tailstock is used for turning long, thin bodies.

→ Loosen the adjusting screws in the front and in the rear of the tailstock.

❍ By alternately loosening and tightening the two (front and rear) adjusting screws, the tailstock is moved out of the central position. The desired cross-adjustment can be read off the scale.

→ Re-tighten the adjusting screws of the tailstock.



Img. 4-8: Cross-adjustment of the tailstock

INFORMATION

The tailstock may be cross-adjusted by approximately + - 13 mm to the front or the back.
Example:
A 300mm long shaft is to be taper-turned between the centres with an angle of 1°.
Cross-adjustment of the tailstock = 300mm x Tan 1°. The tailstock must be cross-adjusted by approximately 5.236mm.

CAUTION!

Check clamping of the tailstock and the sleeve, respectively for the turning jobs between the centres!

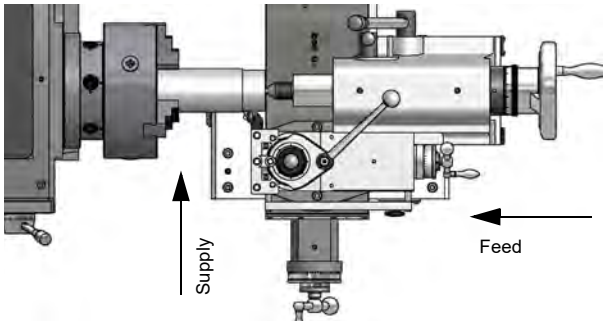
Tighten the securing screw at the end of the lathe bed in order to prevent the tailstock from unintentional drawing-out of the lathe bed.

Img. 4-9: Tailstock

4.21 General operating instructions

4.21.1 Longitudinal turning

In the straight turning operation, the tool feeds parallel to the axis of rotation of the workpiece. The feed can be either manual - by turning the handwheel on the lathe saddle or the top slide - or by activating

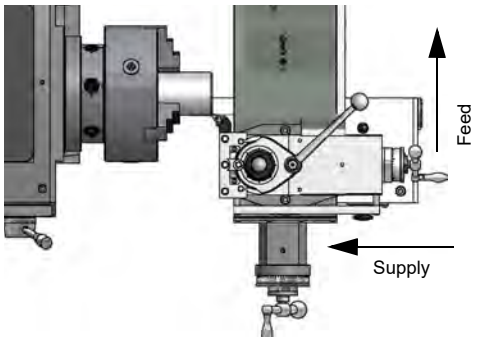


the automatic feed. The cross feed for the depth of cut is achieved using the cross slide.

Img.4-10: Graph: Longitudinal turning

4.21.2 Face turning and recessing

In the facing operation, the tool feeds perpendicular to the axis of rotation of the workpiece. Feed is done manually, using the cross-slide hand wheel. The infeed for cut depth is made with the top slide or lathe saddle.



Img.4-11: Graph: Face turning

4.21.3 Fixing the lathe saddle

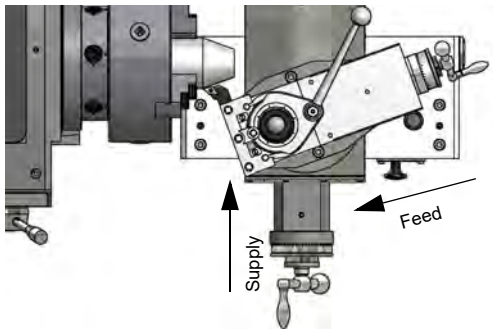
The cutting force produced during facing, recessing or slicing processes may displace the lathe saddle.

→ Secure the lathe saddle using the tightening screw.

Img.4-12: Lathe saddle tightening screw

4.21.4 Turning short tapers with the top slide

Short tapers are turned manually with the top slide. Swivel the top slide to the required angle. The infeed is achieved with the cross slide.



Img.4-13: Graph: Turning tapers

→ Loosen the two clamping screws in the front and in the rear of the top slide.

→ Swivel the top slide.

→ Clamp the top slide again.

4.21.5 Thread cutting

The thread cutting process requires that the operator has a good knowledge of turning and sufficient experience.

INFORMATION

Due to a safety mechanism, it is not possible to use the

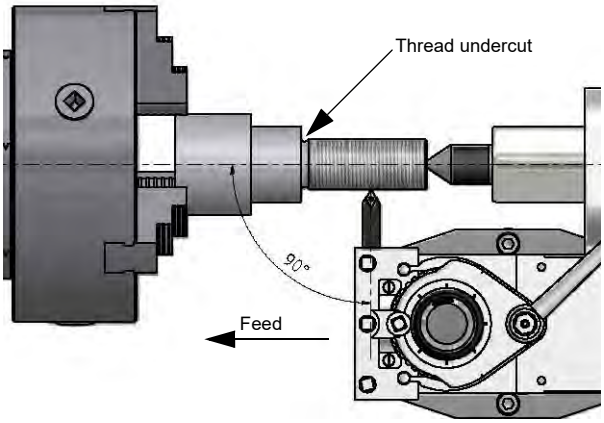
- longitudinal feed via the lead screw and
- cross feed / longitudinal feed with feed rod

at the same time.

NOTES!

Example of an external thread:

- The workpiece diameter must have been turned to the diameter of the desired thread.
- The workpiece requires a chamfer at the beginning of the thread and an undercut at the thread run out.
- The speed must be as low as possible.
- The thread cutting tool must be exactly the same shape as the thread, it must be absolutely rectangular and must be clamped in a way that it coincides exactly with the turning centre.
- The threading engaging lever must be engaged during the whole thread cutting process. This does not apply to thread pitches that can be carried out with the thread gauge.
- The thread is produced in various cutting steps in a way that the cutting tool has to be turned out of the thread completely (with the cross slide) at the end of each cutting step.
- The tool is withdrawn with the lead screw nut engaged and the thread cutting tool disengaged by actuating the "Direction of rotation control lever".
- Stop the lathe and feed the thread cutting tool in low cut depths using the cross slide.



Img.4-14: Graph: Thread cutting

- Before each passage, place the top slide approximately 0.2 to 0.3 mm to the left and right alternately in order to cut the thread free. In this way, the thread cutting tool cuts only on one thread flank with each passage. Do not execute any more free cutting, just before reaching the full thread depth.

4.22 Cooling lubricant

WARNING!

Ejection and overflowing of coolants and lubricants. Make sure you do not get the cooling lubricants on the floor. Spilled on the floor cooling agents must be removed immediately.

Friction during the cutting process causes high temperatures at the cutting edge of the tool.

The tool should be cooled during the milling process. Cooling the tool with a suitable cooling lubricant ensures better working results and a longer service life of the cutting tool.

INFORMATION

The lathe is lacquered with a one-component paint. Consider this fact when selecting your cooling lubricant.

The company Optimum Maschinen Germany GmbH does not assume any guarantee for subsequent damages due to unsuitable cooling lubricants.

The flashpoint of the emulsion must be higher than 140°C.

When using non-water-miscible cooling lubricants (oil content > 15%) with a flashpoint, ignitable aerosol air mixtures might develop. There is a potential danger of explosion.

The selection of cooling lubricants and slideway oils, lubricating oils or greases as well as their care are being determined by the machine operator or operating company.

Therefore, Optimum Maschinen Germany GmbH cannot be held liable for machine damages caused by unsuitable coolants and lubricants as well as by inadequate maintenance and servicing of the coolant. In case of problems with the cooling lubricant and the slideway oil or grease, please contact your mineral oil supplier.

CAUTION!

The cooling lubricant needs to be checked at least weekly, including during downtimes, with regard to its concentration, ph-value, bacteria and fungal decay.

► **Inspection plan for water-mixed cooling lubricants on page 89**

Please note the VKIS - VSI - IGM substance list for coolant lubricants as per DIN 51385 for metal working.

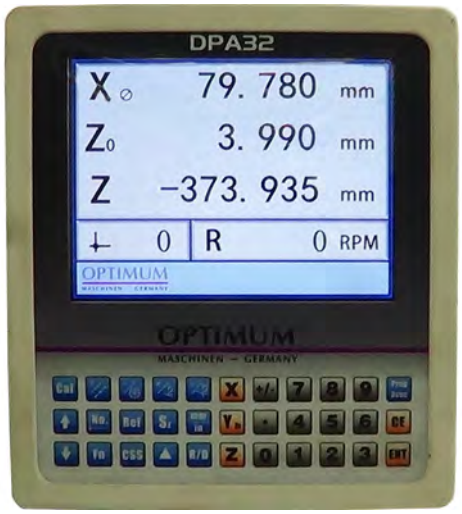
We would like to ask you to have the following machine-related properties of the cooling lubricant confirmed in writing by the manufacturer of the cooling lubricant.

- The products must comply with the provisions of the current statutory regulations and the employers' liability insurance association.
- Request documentation for the products such as the product description VKIS and EC safety data sheet from the cooling lubricants manufacturer. The EC safety data sheet gives you information about the water hazard class.

They need to be environmentally friendly and workplace-friendly. Thus, they need to be free of nitrite, PCB, chlorine and nitrosatable diethanolamine (DEA), according to TRGS 611.

- The manufacturer should be able to provide a certificate concerning skin tolerance.
- The mineral oil content according to DIN 51417 should be at least 40% in the concentrate.
- If possible, it should be universally applicable for all chippings and materials.
- Long service life of the emulsion e.g. long-term stable and resistant to bacteria.
- Safe corrosion protection according to DIN 51360/2.
- Re-emulsifiable and non-adhesive according to VKIS sheet 9: Sticking and residue behaviour.
- It should not attack the varnish of the machine according to VDI 3035.
- It should not attack any machine elements (metals, elastomers).
- Low foaming behaviour of the emulsion.
- It should be as finely dispersed as possible in order to avoid clogging in the needle slot screen.

4.23 Operation DPA 32



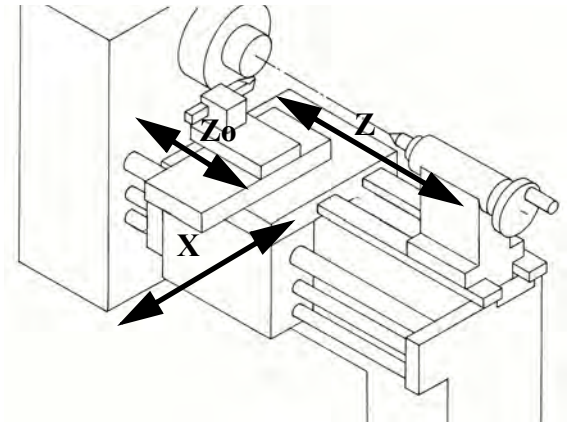
When the unit is switched on, the DRO starts a self-test.

After completion of the self-test, the DRO changes to the normal display state. The DRO displays the last data before switching off.

- O The selected coordinates and the selected tool.
- O The metric or Anglo-American system of measurement.
- O The last values displayed.

4.23.1 Description of the Keys

Letter/Symbol on the key	Name of the key	Function description
	X axis key	To select the X coordinate axis
	Y axis key Z_0 key	To select the Y coordinate axis, Z_0 - axis
	Z axis key	To select the Z coordinate axis
	Plus and minus signs with numerical keys and decimal point	For input of negative or positive signs. For numeric entry. For input of decimal places; decimal point
	Delete key	To clear displayed value of a specific axis or give up the current operation

ENT	Enter key	To confirm the data input
R/D	Radius or Diameter	X-axis display when used on lathes
mm in	Shift key Metric / inches	Display of values o in the metric system o in the Anglo-American measurement system
	Machine zero point	for setting an absolute zero-point in the coordinate system ► Machine zero point function on page 64
Sz	Z+ Z_0 key (3 axes)	For display of the Z+ Z_0 value Bed slide travel and top slide travel are added together. This function is only active if the Y-axis on lathes is set to Z_0 for the top slide, otherwise you only get a beep when you press the Sz key.
		
Prog 3sec	Programming key	For internal parameter settings ► CSS gear setting on page 73
Cal	Calculator function key	► Calculator function on page 65

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	o Addition	► Calculator function on page 65
	o Subtraction	
	o Multiplication	
	o Division	
	Coordinate points along a diagonal line	► Coordinate points along a diagonal line on page 66
	Coordinate points on a circle	► Coordinate points on a circle or arc on page 67
	Function of an inclined plane	
	Arc function	
	Tool data function	► Tool Data Function on page 65 ► Recall of tool data on page 66
	Arrow keys	Moves the cursor or changes the settings of the optional parameters.
	FN key	Multiplex function key
	Cutting speed CSS function	Start and stop of the constant cutting speed function. Parameter input when starting the function. ► CSS gear setting on page 73
		Can only be used in conjunction with speed-controlled lathes.

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4.23.2 Parameterising the individual axes

- O Press and hold Prog 3sec to access the parameter setting interface.
- O Press the buttons ↑ ↓ to move the cursor » and select the corresponding parameter.
- O To cancel an entry, press the key CE.
- O Press the key ENT to save an entry.

Axis name:

Possible parameters: X | Y | Z | Z_0

The displayed axis name can be selected as X, Y, Z or Z_0 depending on the mounting position of the sensor.

Use the numeric buttons 2 and 4 to change the axis name.

Direction:

Negative or positive value in the direction of movement.

Selectable parameter: + | -

Use the numeric buttons 0 and 1 to change the direction of movement (counting direction).

Counting resolution:

Numerical parameter: The unit of the counting resolution of the sensor is 0.0001 mm; the actual resolution of the sensor used is entered here.

- O old type, plastic: CSD203R Optimum magnetic tape with sensor (± 40 µ).
  Required setting of the counting resolution: 0.003mm
- O new type, Metal casing: CSD205 Optimum magnetic tape with sensor (± 10 µ).
  Required setting of the counting resolution: 0.005mm
- O Large Optimum ball measuring bars: Counting resolution 0.005mm
- O Small, short ball measuring bars: Counting resolution 0.002mm

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Display resolution:

Numerical parameter: Display unit whose value should be greater than the counting resolution of the sensor itself. A smaller value does not lead to a better display result or an actually better measurement result.

Compensation (Linear Compensation)

Numerical parameter: ± 99999.999 mm/m can be set here as linear length compensation per metre. The compensation value represents the compensation amount per metre of the corresponding axis.

4.23.3 Setting the spindle speed display

RPM-Axis:

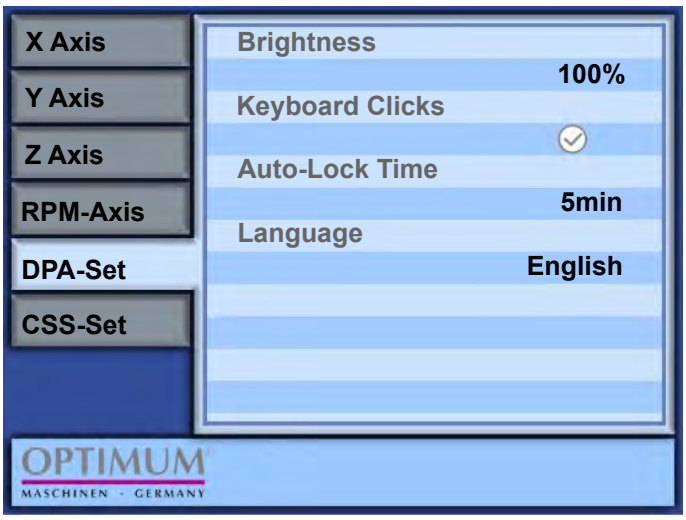
Numerical parameter: Number of transducer signals used per revolution.

The set value of the number of pulses per revolution of the speed signal. The number of pulses per revolution of the speed signal depends on the number of output pulses per revolution of the transducer used (i.e. the speed disc). The larger this value, the higher the resolution of the speed signal. The range of possible setting values extends from 1 to 99.

Display filtering:

This parameter can fix the display flickering caused by unstable speed.

4.23.4 DPA setting



Brightness:

LCD display brightness setting (can be set between 20% - 100%).

Keyboard Clicks:

Keyboard playback sounds

Possible parameters: 0 | 1

Press the numeric key 0 ; 1 to switch the key tone on or off.

Auto-Lock Time:

Activating the screen saver

Numerical parameter: 0 to 999 minutes

If there is no position change in the 3-axis, no operation, the DPA will automatically reduce the brightness of the screen after the set time to protect the backlight of the screen and prolong the life of the screen. Press any key or move any coordinate to restore the display.

Language:

INFORMATION

Switching to another language is possible from serial number 1300200074.

Use the number keys to change the language.

- 0= English
- 1 = German
- 2 = French
- 3 = Spanish

4.23.5 Machine zero point function

For the setting of an absolute zero point.

Press the button . The display shows flashing.

The axis values shown for the current machine position are reset to zero. Values for the axes may also be input where needed.

When the machine zero point is turned off, the previous values are shown again.

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4.23.6 Calculator function

Add, subtract, multiply and divide.

O Press button

to start the calculator. The display shows . The number field of the rotation speed indicator is used as the input- and result field.

O To exit from the Calculator function, press the

button.

Keys

O to add. to subtract. to multiply.

to divide.

Example:

Press the following keys in the order shown in order to divide the number 46.2 by 2, and transfer the result to the Z axis.

4.23.7 Tool Data Function

Creates up to 99 tool data sets in relation in the coordinate system.

Usage of the tool data function makes it possible to establish a specific relationship between the tool data in the coordinate system and the displayed values.

INFORMATION

The Save function for tool data only works when the Reference Mark function is activated. ► Parameterising the individual axes on page 62.
Saved values remain even by loss of electric power.

Example:

Tool data no. 2 should lie at X = 1.000 and Y = 2.000 to the shown values.

Press the following keys in the order shown in order to input the values X = 1.000 and Y = 2.000 under tool data no. 2.

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4.23.8 Recall of tool data

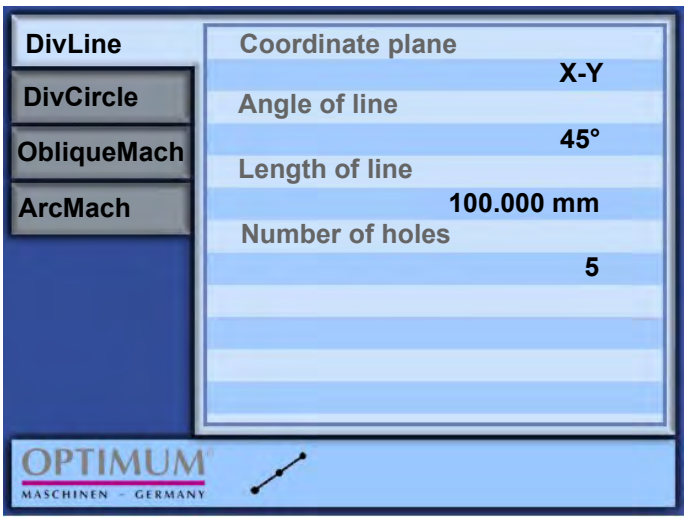
Example:

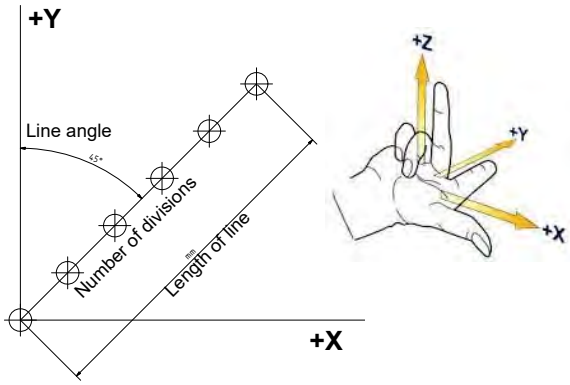
The tool data set no. 2 should be used at the currently displayed position.

Press the following keys in the order shown in order to use tool data set no. 2.

4.23.9 Coordinate points along a diagonal line

Creates a line within a coordinate system along which a certain number of uniformly distributed coordinate points are defined.





Setting the parameters as required:

Coordinate plane:

Possible parameters: X-Y | X-Z | Y-Z

O Press the

,

or

key to select X-Y, Y-Z or X-Z as the coordinate plane.

Angle of line:

The inclination between the line segment to be divided and the X axis in positive direction. (in the X-Y plane, an inclination between the line segment to be divided and the Y-axis in positive direction);

O Enter the angle of the line using the number keys and confirm with the key

.

Length of the line:

The length of the line segment to be divided evenly.

O Enter the the length using the numeric keys and confirm with the key

.

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Number of holes:

The number of points to be evenly divided in the line segment.
(n points to divide the line segment evenly into n-1 segments).

O Enter the number of the holes using the numeric keys and confirm with the key ENT.

Procedure:

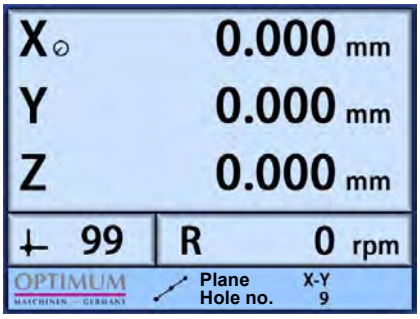
O First move the machine tool to align the first point of the drill hole with the oblique line.

O Press the key to access the parameter settings. Press the key again to exit the parameter settings or function.

O Use the arrow keys to select the menu item and enter the desired value.

O Press the key Prog 3sec to execute the function.

Parameter: The display shows:



O Press the key ENT to query the individual coordinate points.

Positioning to coordinate points:

O Press the key ENT to select the desired coordinate point.

O Travel the machine axes until the positions of the selected coordinate axes are 0.000.

INFORMATION

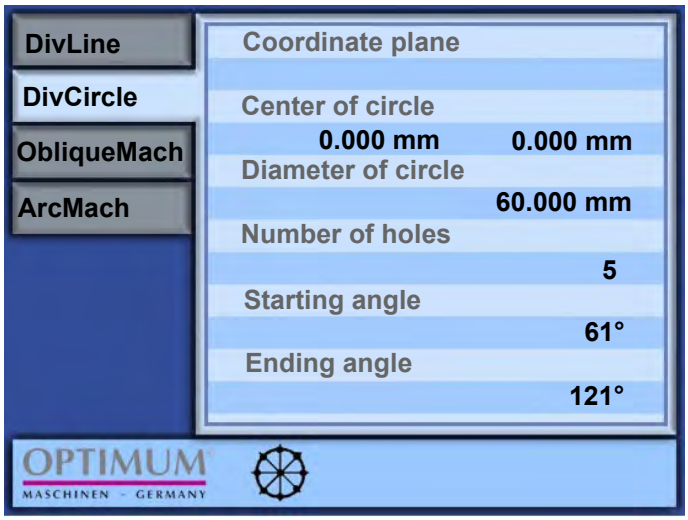
Press the key 0 to temporarily interrupt the function. The display returns to normal. Press the key 0 again to continue with the function.

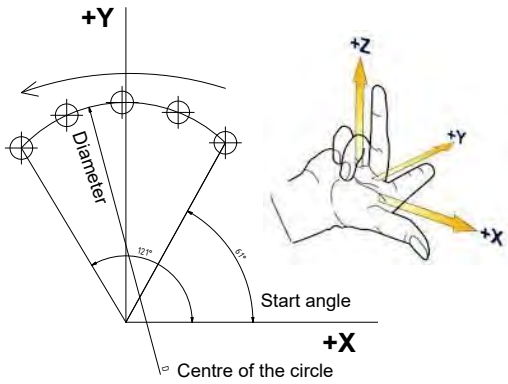
4.23.10 Coordinate points on a circle or arc

Function: Creates a circle or arc within a coordinate system along which a certain number of uniformly distributed coordinate points are defined. The defined coordinate points on the circle or arc run counterclockwise. Coordinate point 2 is located counterclockwise from coordinate point 1.

INFORMATION

Enter 360° to define a full circle. Enter a value of less than 360° to define an arc.





Setting the parameters in sequence as required.

Coordinate plane:

Possible parameters: X-Y | X-Z | Y-Z

O Press the 1, 2 or 3 key to select X-Y, Y-Z or X-Z as the coordinate plane.

Center of circle:

The coordinate for the centre of the arc or the centre of the circle.

O Enter the centre of the arc in the coordinate plane using the numeric keys and confirm with the key ENT.

Diameter of circle:

The diameter of the arc or circle on which coordinate points are to be evenly divided.

O Enter the centre of the arc or circle in the coordinate plane using the numeric keys and confirm with the key ENT.

Number of holes:

The number of points that evenly divide the arc or circle. n points divide an arc section into n-1 segments.

O Enter the number of coordinate points using the numeric keys and confirm with the key ENT.

Starting angle:

Angle of the starting point of the arc or circle to be evenly divided.

O Enter the starting angle on the coordinate plane with the numeric keys and confirm with the key ENT.

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Ending angle:

Angle of the end point of the arc or circle to be divided evenly.

O Enter the end angle on the coordinate plane with the numeric keys and confirm with the key ENT.

INFORMATION

The angles of the start and end points of the arc are all calculated counterclockwise. In the X-Y or X-Z plane, the positive direction of the X axis is assumed to be the direction of 0 degrees and the positive direction of another axis is assumed to be the direction of 90 degrees; in the Y-Z plane, the positive direction of the Y axis is assumed to be the direction of 0 degrees and the positive direction of the Z axis is assumed to be the direction of 90 degrees.

Procedure:

O First move the machine tool to align the first machining point.

O Press the key to access the parameter settings. Press the key again to exit the menu or function.

O Use the arrow keys to select the menu item and enter the desired value.

O Press the key Prog 3sec to execute the function.

Parameter: The display shows:

O Press the key ENT to query the individual coordinate points.

Positioning to coordinate points:

O Press the key ENT to select the desired coordinate point.

O Traverse the machine axes until the positions of the selected coordinate axes are 0.000.

INFORMATION

O Press the key 0 to temporarily interrupt the function. The display returns to normal.

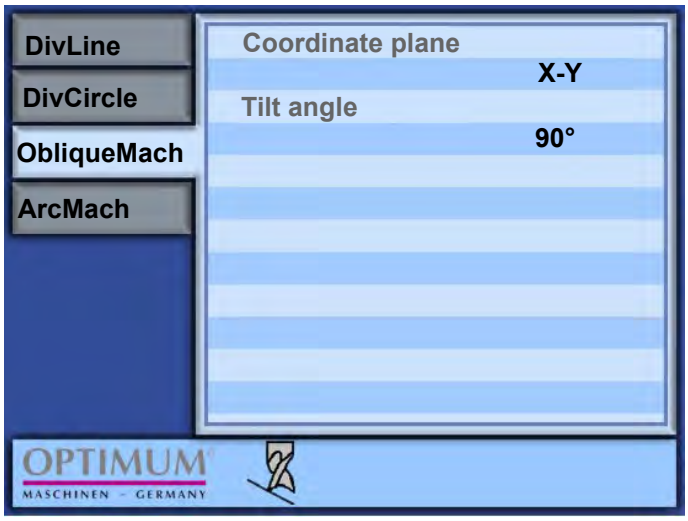
Press the key 0 again to continue with the function.

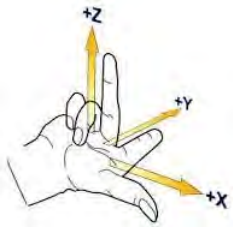
4.23.11 Oblique line machining

Function: Creates an inclined plane in a coordinate system so that machining operations can be performed on this inclined plane.

INFORMATION

Possibility of machining: In the machining state, the operator can move the first axis with the hand crank, which changes the value displayed by the first axis on the DRO. The operator can now move the second axis with the other hand to ensure that the value displayed by the second axis of the DRO approaches zero so that the tool moves along the inclined plane determined by the input angle.





Setting the parameters in sequence as required.

Coordinate plane:

Possible parameters: X-Y | X-Z | Y-Z

O Press the 1, 2 or 3 key to select X-Y, Y-Z or X-Z as the coordinate plane.

Inclined angle:

The inclination of the plane in the X-axis in the positive direction (in the Y-Z plane, an inclination between the plane and the Y-axis in the positive direction).

O Enter the angle of the inclined plane using the numeric keys and confirm with the key. ENT.

Procedure

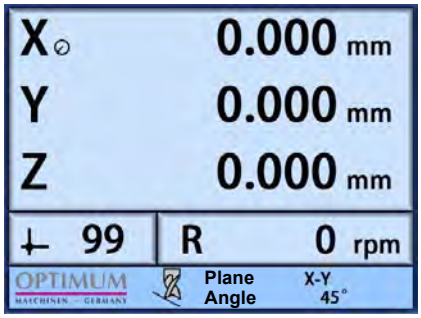
O First move the machine tool to align the first machining point.

O Press the key to access the parameter settings. Press the key again to exit the menu or function.

O Use the arrow keys to select the menu item and enter the desired value.

O Press the key Prog 3sec to execute the function.

Parameter: The display shows:



Positioning on a coordinate point on the inclined plane:

O Traverse the axes of the machine until the positions of the selected coordinate plane are 0.000.

DPA32_GB_3.fm

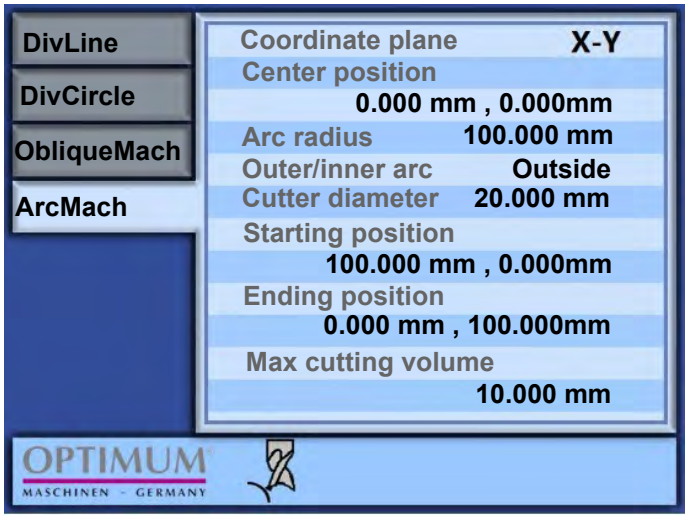
INFORMATION

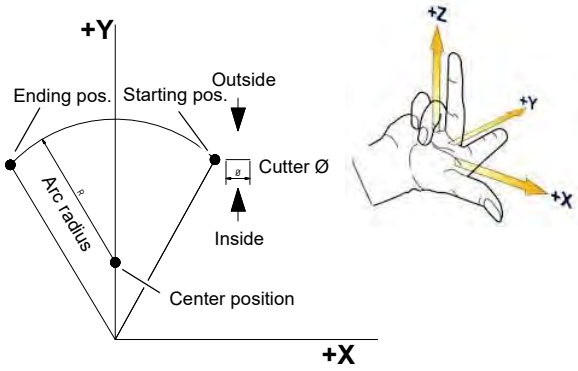
O Press the key 0 to temporarily interrupt the function. The display returns to normal.

Press the key 0 again to continue with the function.

4.23.12 Arc machining

Function: Creates an arc in a coordinate system so that machining operations can be performed on this arc.





Setting the parameters in sequence as required.

Coordinate plane:

Possible parameters: X-Y | X-Z | Y-Z

O Press the 1, 2 or 3 key to select X-Y, Y-Z or X-Z as the coordinate plane.

Center position:

Coordinate of the centre of the arc.

O Enter the centre of the arc in the coordinate plane using the numeric keys and confirm with the key ENT.

Arc radius:

The diameter of the arc.

O Enter the radius of the arc with the numeric keys and confirm with the key ENT.

Outer/inner arc:

Machining type for the arc. The processing on the arc should be inside or outside.

O Set the type of arc processing with the numeric keys 0 or 1 and confirm with the key ENT.

0 = Machining of the arc from the inside.

1 = Machining of the arc from the outside.

Cutter diameter:

The diameter of the tool (cutter) for machining on the arc.

O Enter the diameter of the milling tool using the numeric keys and confirm with the key ENT.

Starting position:

Coordinates of the starting point of the arc to be processed.

O Enter the start position of the arc on the selected coordinate plane with the numeric keys and confirm with the key ENT.

Ending position:

Coordinates of the end point of the arc to be processed.

O Enter the end position of the arc on the selected coordinate plane with the numeric keys and confirm with the key ENT.

Max cutting volume:

Maximum permissible machining depth for each machining operation.

O Enter the machining depth using the numeric keys and confirm with the key ENT.

Procedure

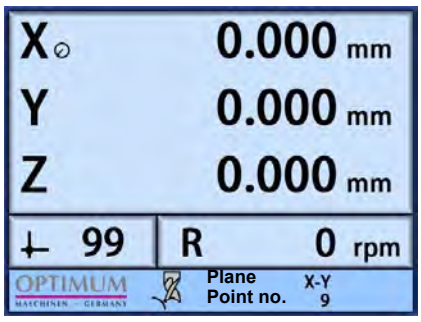
O First move the machine tool to align the first machining point.

O Press the key to access the parameter settings. Press the key again to exit the menu or function.

O Use the arrow keys to select the menu item and enter the desired value.

O Press the key Prog 3sec to execute the function.

Parameter: The display shows:



Positioning on a coordinate point on the arc:

O The coordinates of the first point of the coordinate plane are displayed. Traverse the axes of the machine until the positions on the selected coordinate plane indicate 0.000.

O Press the key ENT to display the second point on the coordinate plane. Traverse the axes of the machine until the positions on the selected coordinate plane show 0.000. Repeat these steps until the arc is completely finished.

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INFORMATION

O Press the key 0 to temporarily interrupt the function. The display returns to normal.

Press the key 0 again to continue with the function.

4.23.13 CSS gear setting

INFORMATION

Can only be used in conjunction with speed-controlled lathes.

According to the gear labelling on the lathe, the maximum and minimum speed of 6 gears is set for the CSS function calculation. This means that the actual speed matches the spindle when the 0V - and 10V analogue values control the output frequency of the frequency inverter.

4.23.14 Change information operating manual

Chapter	Short summary	new version number
Operation	Reference marker deactivated, reference function removed	1.2
1.9.2 ; 3	Setting the axis parameters for different magnetic sensors ; Description of sensors	1.3
1.9.2	Buttons for changing the axis designation and counting direction	1.3.1
	Resolution for small, short MSSR linear encoders	1.3.2

5 Constant cutting speed - CSS function

CAUTION!

Uncontrolled release of the workpiece from the lathe chuck. As the speed increases, the centrifugal force on the chuck jaws increases. This reduces the effective clamping force of the workpiece in the lathe chuck.

Only use lathe chucks that correspond to the maximum possible speed of the lathe.

Make sure that the workpiece is firmly clamped in the lathe chuck at the maximum possible clamping force when using the constant cutting speed.

INFORMATION

Can only be used in conjunction with speed-controlled lathes.

In conjunction with electronically controllable drives on manual lathes, the constant cutting speed enables the cutting speed of the turning tool to remain constant as the diameter of the workpiece increases or decreases. The speed is therefore adapted to the current diameter of the workpiece. The smaller the current diameter of the workpiece, the higher the speed should be.

The constant cutting speed is preferably used for facing large-surface parts. By using the constant cutting speed, a constant turning pattern and a uniform surface quality on workpieces is possible.

5.1 Activating the constant cutting speed

O Press the CSS key to call up the CSS function. Press the CE button to exit and the ENT button to confirm the entry according to the prompt.

**You will start the CSS function,
Are you sure?**

O Enter the gear level in which you are working. (You must set the maximum and minimum speed of each stage in advance).

Enter the gear step you are working on.

O Confirm whether the entered stage and the corresponding speed range are correct.

Press the key CE to return and press the key ENT to continue entering.

**The machine is working on
Gear 1 , 50 -- 800 RPM.
Are you sure?**

O Entry of the maximum speed of the chuck.

Enter the max speed of the chuck.

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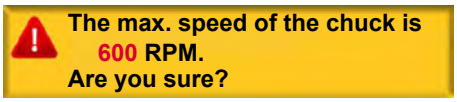
O Confirm whether the maximum speed of the lathe chuck is correct.

Press the key CE to return and press the key ENT to continue entering.



O Entry of the desired constant cutting speed. (Unit: m/min)

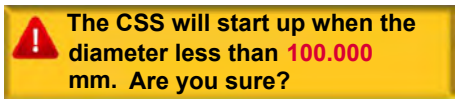
O Confirm that the constant cutting speed entered is correct.

Press the key CE to return and press the key ENT to continue entering.

O Entry of the maximum switch-on diameter. (Unit: mm)

O Confirm whether the maximum start diameter entry is correct.

Press the key CE to return and press the key ENT to continue entering.



Start the CSS function.

INFORMATION

The CSS function is only activated when the display is switched to diameter.

The DPA32 then disables potentiometer control for spindle speed, but instead calculates the required spindle speed based on the X-axis value and the setting parameters, and finally outputs the analogue quantity for spindle speed control.

Note: The R symbol for the speed indicator flashes after the CSS function has been activated. Press the CSS button to exit the CSS function at any time and to restore potentiometer control for spindle speed. If you call up the CSS function again, the parameters must be confirmed again and re-entered if necessary. The spindle speed is controlled again via the potentiometer after switching off the DRO.

6 Cutting speeds

6.1 Selecting the cutting speed

The variety of factors makes it impossible to present universal indications about the "correct“ cutting speed.

Tables with reference values about cutting speeds to be set must be evaluated with utmost caution since they only apply for very particular cases. The reference values without cooling (no best values) which are indicated in AWF documents are highly recommended. Furthermore, the tables of reference values of the manufacturers of cutting materials should be evaluated e.g. for hard metal cutting materials the indications of the company Friedrich Krupp Widia-Fabrik, Essen applies.

V_{c60} is the cutting speed at 60 min. service life, V_{c240} according for 240 min. service life. Select V_{c60} for simple, easily replaceable lathe tools; V_{c240} for simple tool sets depending on one another; V_{c480} for complicated tool sets where the tool change requires more time due to the dependencies on one another and the accuracies of the cutting insert. The same considerations apply with regard to maintenance of the tools. It generally applies: High cutting speeds result in low-time chipping, little cutting speeds result in cost-efficient chipping.

6.2 Influences on the cutting speed

$\mathbf{v_c}$ = Cutting speed in [m/min]

t = Service life in [min]

The service life **t** is the period of time in minutes during which the cutting insert performs cutting tasks until it is necessary to re-sharpen it. It is of utmost commercial importance. For the same material **t** is smaller the higher you select the value $\mathbf{v_c}$ e.g. only a few minutes at $\mathbf{v_c}$ = 2000 m/min. Different materials require different $\mathbf{v_c}$ for the same **t** . All considerations of this type require that the other cutting conditions are maintained constant (material, tool and setting conditions). If only one of these condition changes it is also necessary to change $\mathbf{v_c}$ in order to obtain the same **t** . Therefore, only cutting speed tables are reasonable which show all relevant cutting conditions.

6.3 Example for the determination of the required speed on your lathe

The necessary speed is depending on the diameter of the workpiece, of the material to be machined, of the turning tool, as well as of the setting of the turning tool (cutting material) to the workpiece.

Material to be turned: St37

Cutting material (turning tool): Hard metal

Setting angle [k_r] of the turning tool to the workpiece: 90°

selected infeed [f]: about 0.16mm/rev

the cutting speed [V_c] according to the table: 180 meters per minute

diameter [d] of your workpiece: 60mm = 0.06m [meters]

Speed $n = \frac{Vc}{\pi \times d} = \frac{180m}{min \times 3.14 \times 0.06m} = 955$ rpm

Set the speed on your lathe below the calculated speed.

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6.4 Cutting speeds table

Reference values for cutting speeds $\mathbf{v_c}$ in **m/min** when turning high speed steel and hard metal. (Excerpt from VDF 8799, Gebr. Boehringer GmbH, Göppingen)

Material	Tensile strength R_m in N/mm²	Cutting material [3]	Infeed *f* in mm/rev. and setting angle k_r [1] [2]																										
			0.063			0.1			0.16			0.25			0.4			0.63			1			1.6			2.5		
			45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°	45°	60°	90°
St 34; St 37; C22; St 42	up to 500	High-speed steel							50	40	34.5	45	35.5	28	35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10
		P 10	250	236	224	224	212	200	200	190	180	180	170	160	162	150	140	140	132	125	125	118	112	112	106	100			
St 50; C 35	500...600	High-speed steel							45	35.5	28	35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8
		P 10	224	212	200	200			180	170	160	160	150	140	140	132	125	125	118	112	112	106	100	100	95	90			
St 60; C45	600...700	High-speed steel							35.5	28	22.4	28	22.4	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3
		P 10	212	200	190	190	180	170	170	160	150	150	140	132	132	125	118	118	112	106	106	100	95						
St 70; C60	700...850	High-speed steel							28	22.4	18	25	20	16	12.5	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3	8	6.3	5
		P 10	180	170	160	160	150	140	140	132	125	125	118	112	106	100	95	95	90	85	85	80	75						
Mn-; CrNi-, CrMo- among others alloyed steels	700...850	High-speed steel							25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	11	9	7	9	7	5.6	7.5	6	4.5
		P 10	180	170	160	160	150	140	140	132	125	125	118	112	106	100	95	95	90	85	85	80	75						
	850...1000	High-speed steel							20	16	12.5	16	12.5	10	12.5	10	8	10	8	6.3	8	6.3	5	7.1	5.6	4.5	5.6	4.5	3.6
		P 10	140	132	125	125	118	112	100	95	90	90	85	80	71	67	63	63	60	56	56	53	50						
	1000..1400	High-speed steel							14	11	9	11	9	7	9	7	5.6	7	5.6	4.5	5.6	4.5	3.6	4.5	3.6	2.8	3.6	2.8	2.2
		P 10	80	75	71	71	67	63	63	60	56	56	53	50	50	47.5	45	45	42.5	40	33.5	33.5	31.5						
Rust-resistant steel	600..700	P 10	80	75	71	71	67	63	56	53	50	50	47.5	45	45	42.5	40	33.5	33.5	31.5	31.5	30	28						
Tool steel	1500..1800	High-speed steel							9	7	5.6	5.6	4.5	3.6	4	3.2	2.5												
		P 10	45	42.5	40	40	37.5	35.5	35.5	33.5	31.5	28	26.5	25	25	23.4	22	22	21	20	18	17	16						
Mn - High-carbon steel		P 10	33.5	33.5	31.5	31.5	30	28	28	26.5	25	22	21	20	20	19	18	18	17	16									
GS-45	300..500	High-speed steel							45	35.5	28	35.5	28	22	31.5	25	20	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8
		P 10	150	140	132	118	112	106	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60						
GS-52	500..700	High-speed steel							28	22	18	25	20	16	20	16	12.5	16	12.5	10	12.5	10	8	11	9	7	9	7	5.6
		P 10	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5						
GS-15	HB...2000	High-speed steel							45	40	31.5	31.5	28	22	22	20	16	18	16	12.5	12.5	11	9	11	10	8	9	8	6.3
		K20	125	118	112	112	106	106	100	95	95	90	85	85	80	75	75	71	67	67	63	60							
GS-25	HB 2000..2500	High-speed steel							28	25	20	20	18	14	14	12.5	10	11	10	8	9	8	6.3	7.5	6.7	5.3	6	5.3	4.25
		K10	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5	47.5	45	42.5	42.5	40	37.5			
GTS-35 GTW-40		High-speed steel							37.5	33.5	33.5	28	26.5	25	22	21	20	18	17	16	12.5	12	11	11	10	10	9	8.5	8
		K10/P10	95	90	85	85	80	75	75	71	67	67	63	60	60	56	53	53	50	47.5	47.5	45	42.5	42.5	40	37.5			
White cast iron	RC420..570	K10	19	18	17	17	16	15	15	14	13.2	13.2	12.5	11.8	11.8	11.2	10.6	10.6	10	9.5	9	8.5	8	8	7.5	7.1			
Cast bronze DIN 1705		High-speed steel							53	50	47.5	47.5	45	42.5	42.5	40	37.5	37.5	35.5	33.5	31.5	30	28	28	26.5	25	25	23.6	22.4
		K 20	315	300	280	280	265	250	250	236	224	224	212	200	200	190	180	180	170	160	160	150	140	140	132	125			
Red brass DIN 1705		High-speed steel							75	71	67	63	60	56	50	47.5	45	40	37.5	35.5	31.5	30	28	28	26.5	25	25	23.6	22.4
		K 20	425	400	375	400	375	355	355	335	315	335	315	300	300	280	265	265	250	236	250	236	224	236	224	212			
Brass DIN 1709	HB 800..1200	High-speed steel							112	106	100	90	85	80	67	63	60	50	47.5	45	37.5	33.5	33.5	26.5	25	23.6			
		K 20	500	475	450	475	450	425	450	425	400	400	375	355	355	335	315	335	315	300	300	280	265	280	265	250			
AL cast DIN 1725	300..420	High-speed steel	125	118	112	100	95	85	75	71	67	56	53	50	42.5	40	37.5	31.5	30	28	25	23.6	22.4						
		K 20	250	236	224	224	212	200	200	190	180	180	170	160	160	150	140	140	132	125	125	118	112	118	112	106	100	95	90
Mg alloy DIN 1729		High-speed steel	850	800	750	800	750	710	750	710	670	670	630	600	630	600	560	600	560	530	600	560	530	560	530	500	530	500	475
		K 20	1600	1500	1400	1320	1250	1250	1180	1120	1120	1120	1060	1000	1000	950	900	900	850	800	800	750	710	710	670	630	630	600	560

1) The entered values apply for a chipping depth of up to 2.24 mm. From 2.24 mm to 7.1 mm the values must be reduced by 1 stage of the row R10 by approximately 20%. From 7.1 mm to 22.4 mm the values must be reduced by 1 stage of the row R5 by approximately 40%.

2) The values $\mathbf{v_c}$ must be reduced by 30 .... to 50% for turning a crust, for removal of cast skin or for sand inclusions.

3) The service life **t** for hard metal P10, K10, K20 = 240 min; for high speed steel SS = 60 min.

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7 Maintenance

In this chapter you will find important information about

- Inspection
- Maintenance
- Repair

of the lathe.

ATTENTION!

Properly performed regular maintenance is an essential prerequisite for

- **operational safety,**
- **failure-free operation,**
- **long durability of the lathe and**
- **the quality of the products which you manufacture.**

Installations and equipment from other manufacturers must also be in good order and condition.

7.1 Safety

WARNING!

The consequences of incorrect maintenance and repair work may include:

- **Very serious injury to personnel working on the lathe,**
- **Damage to the lathe.**

Only qualified personnel should carry out maintenance and repair work on the lathe.

Electrical systems and operating materials may only be installed, modified and repaired by a trained electrician or supervised and under the control of a trained electrician and must comply with electrotechnical regulations.

WARNING!

Do not climb onto or into the machine while working.

7.1.1 Preparation

WARNING!

Only carry out work on the lathe, if the main switch is switched off and secured against restarting by means of a padlock.

► Disconnecting and securing the lathe on page 19

Attach a warning label.

7.1.2 Restarting

Before restarting, run a safety check.

► Electrical system on page 20
► Safety check on page 17

WARNING!

Before starting the lathe, you must check that there is no danger for persons and that the lathe is not damaged.

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7.1.3 Cleaning

CAUTION!

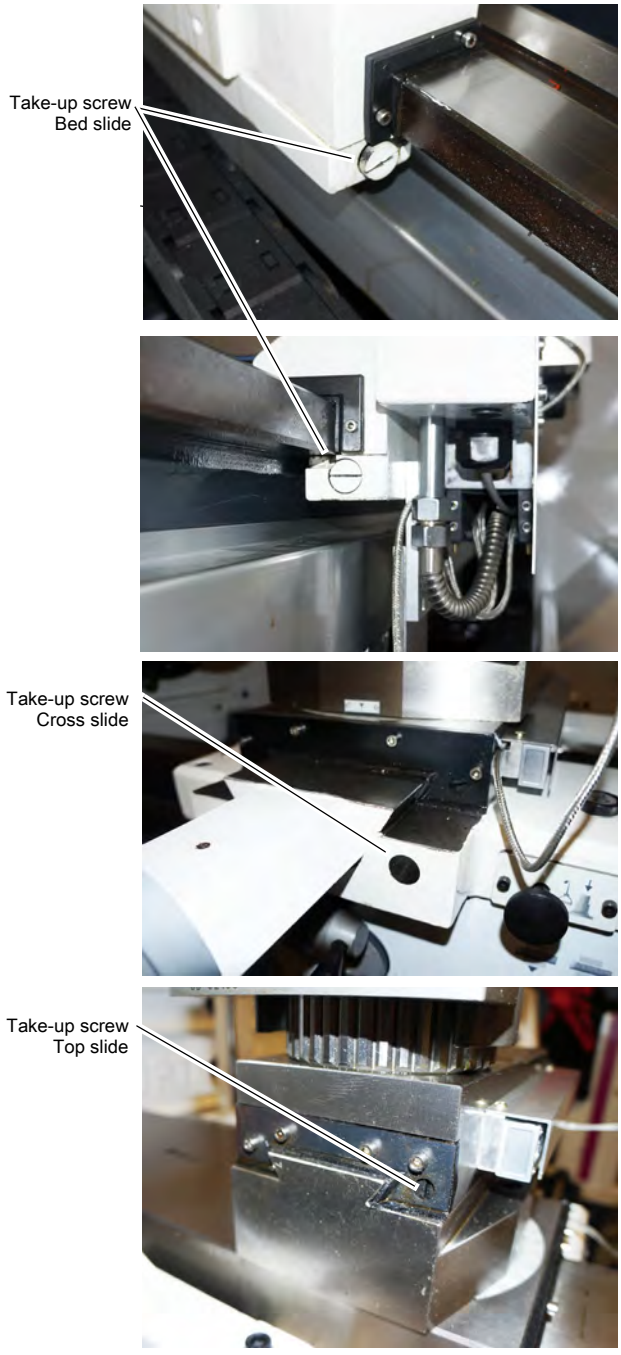
Use a chip hook for removal of chips and wear suitable protective gloves.

7.2 Checkup, inspection and maintenance

The type and level of wear depends to a large extent on the individual usage and operating conditions. Any indicated intervals therefore are only valid for the corresponding approved conditions.

Interval	Where?	What?	How?
Start of work, after every maintenance or repair work	Lathe		► Safety check on page 17
	Lathe	Oiling	→ Oil all guideways. → Slightly lubricate the change gears with lithium-based grease lubricating ► „Img.4-6: Change gear wheel position for metric threads and threads based on the inch-system“ on page 53
	Camlock clamp bolt Lathe spindle fixture	Mounting check	► Adjusting the Camlock bolts to the workpiece holder on page 46

Interval	Where?	What?	How?
As required,	Slideways	Readjusting	Excessive clearance in the slideways can be reduced by readjusting the tapered gibs. → Turn the take-up screw clockwise. The tapered gib is moved to the rear and reduces the clearance of the corresponding slideway.



Img.7-1: Take-up screws, slideways

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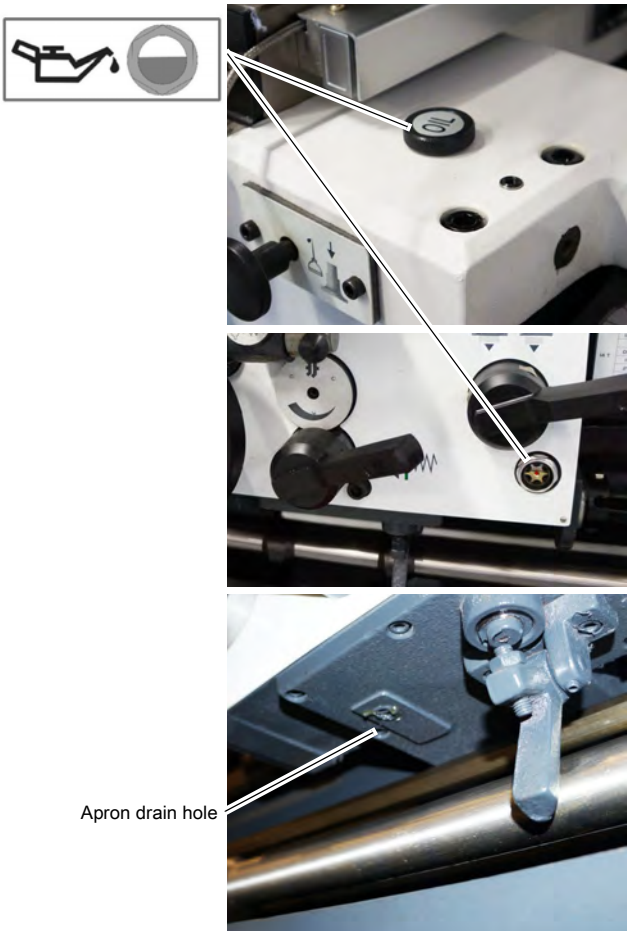
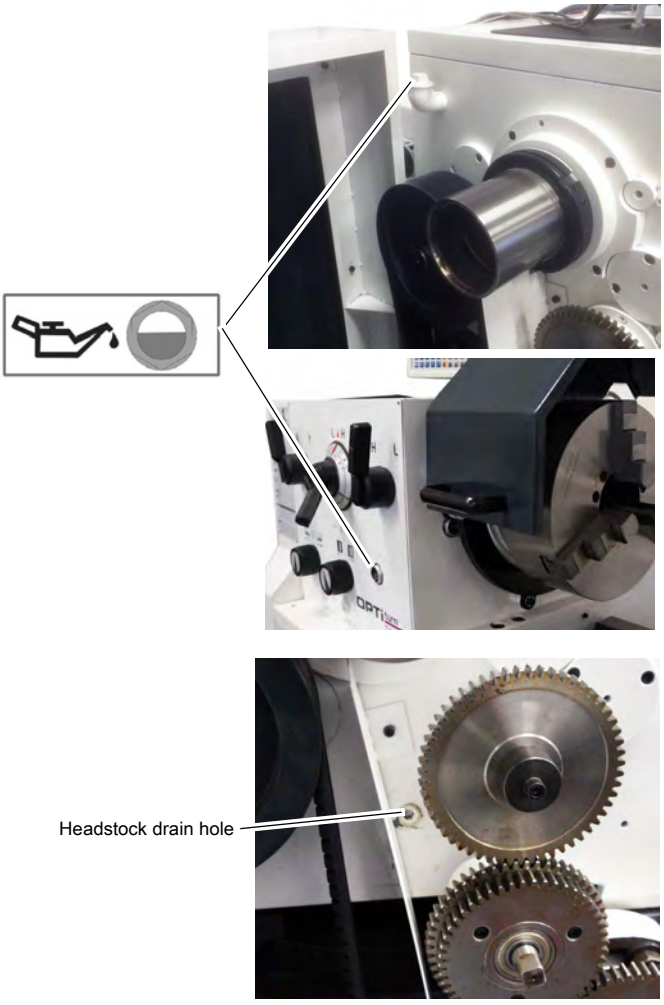
Interval	Where?	What?	How?
Start of work, after every maintenance or repair work	Feed gear Apron Headstock	Visual inspection	→ Check the oil level in the inspection glass ❍ of the feed gear ☞ Img.7-2: auf Seite 81 ❍ of the apron ☞ Img.7-3: auf Seite 82 ❍ of the headstock ☞ Img.7-4: auf Seite 83 → The oil level must at least attain the centre resp. top marking of the oil sight glass.
Weekly	Lathe chuck	Lubricate	► Lathe chuck maintenance on page 48 Lubricate the installed lathe chuck at least once per week. The used lubricant should be of high quality and provided for high pressure bearing surfaces. The lubricant should withstand the coolant and other chemicals. We recommend the use of ALTEMP Q NB 50 by Klueber for the lubrication of the sliding surfaces and clamping fixture of the supplied lathe chucks.
First after 50 operating hours, then once a year	Feed gear	Oil change	→ For oil change use an appropriate collecting container with sufficient capacity. → Unscrew the screw from the drain hole. → Unscrew the screw from the filler hole. → Close the drain hole if no more oil drains. → Fill up to the middle of the reference mark of the oil sight glass into the filler hole using a suitable container. ► Operating material on page 22

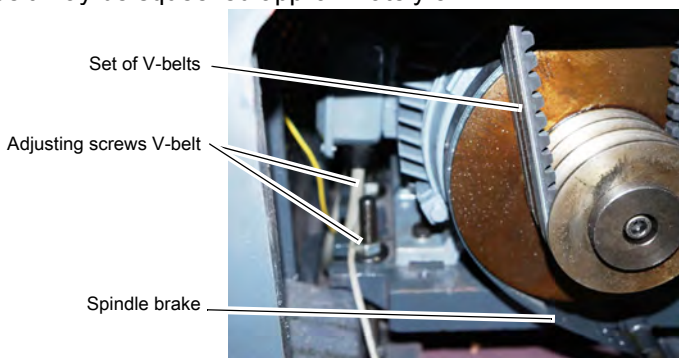
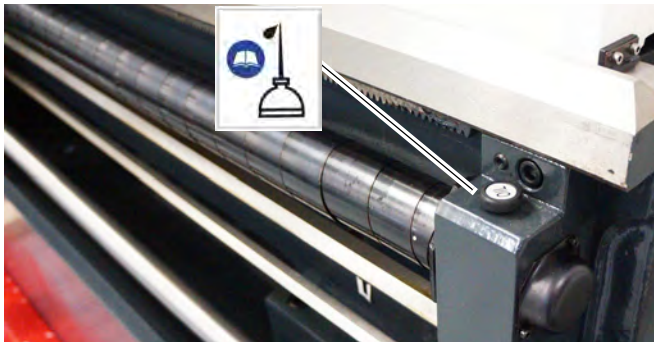
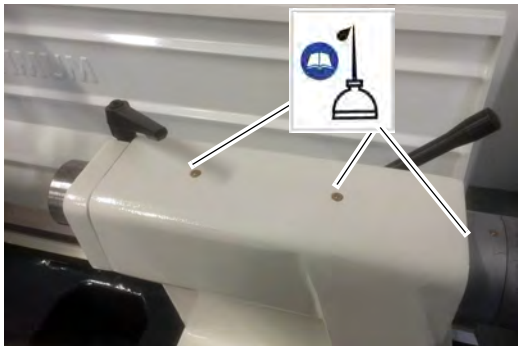
Img.7-2: Oil sight glass feed gear

Interval	Where?	What?	How?
First after 50 hours in service, then once a year	Apron	Oil change	

Img.7-3: Oil sight glass apron

Interval	Where?	What?	How?
First after 50 hours in service, then once a year	Headstock	Oil change	

Img. 7-4: Oil sight glass headstock

Interval	Where?	What?	How?
As required,	Headstock	V-belt check, re-tighten	→ Tighten the V-belt set as required. → If necessary, exchange the complete set of V-belts only. → Use the adjusting screws to tighten the V-belts. → Tighten the adjusting screws in a way that one single V-belt may be squeezed approximately 5mm.  Img.7-5: Drive motor with spindle brake **ATTENTION!** **Only exchange the complete set of V-belts, never a single one.**
Weekly	lead screw, feed rod, tailstock	Oiling	→ Lubricate respectively fill-in all lubricating nipples and oiler cups with machinery oil.   Img.7-6: Lubricating nipples, oil cup

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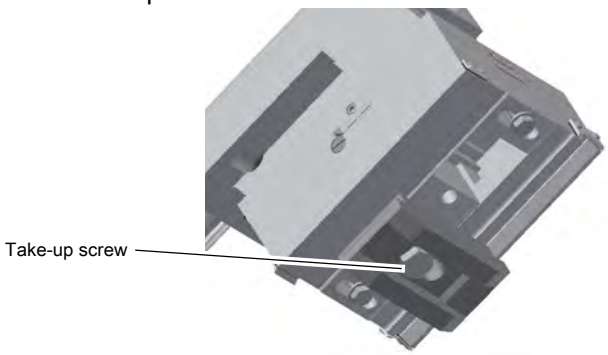
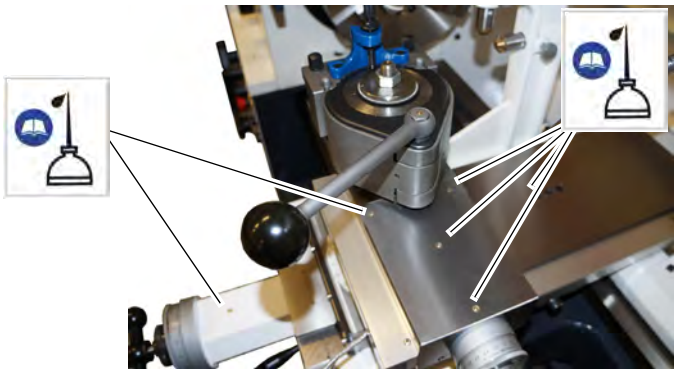
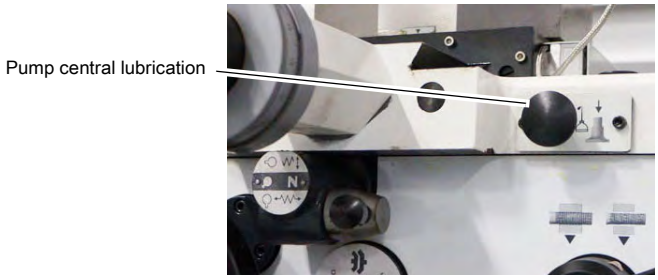
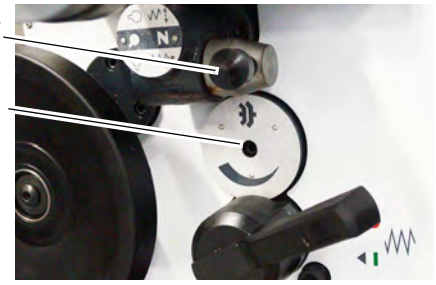
Interval	Where?	What?	How?
As required,	Tailstock	tighten	→ If the tailstock clamping wears off. Shorten the tension way with the take-up screw.  Img.7-7: Tailstock
Weekly	Top slide / cross slide	Oiling	→ Lubricate respectively fill-in all lubricating nipples and oiler cups with machinery oil.  Img.7-8: Lubricating nipple
every week	Lathe chuck	Lubricate	► Lubricating and cleaning the lathe chuck on page 86
every week	Bed slide	Actuate	 Img.7-9: central lubrication **INFORMATION** The pump is permanently being provided with the oil of the apron. Therefore, check the oil level of the apron after each use. ► „Img.7-3: Oil sight glass apron“ on page 82

Interval	Where?	What?	How?
As required,	Apron	Setting the clutch of the feed	O The clutch of the feed is being adjusted with the adjustment screw in the middle of the scale. O Factory settings are 120 N for a power applied to the handwheel of the lathe slide contrary to the feed direction. → Turn it clockwise in order to increase the force of the clutch. → Turn it anti-clockwise in order to reduce the force of the clutch. engaging lever for longitudinal feed and crossfeed Adjusting screw  Img.7-10: chuck longitudinal feed and cross feed
at least annually	Cooling lubricant system	Replace Cleaning Disinfect	► Cooling lubricants and tanks on page 88 ► Inspection plan for water-mixed cooling lubricants on page 89
based on operator's empirical values in accordance with German DGUV (BGV A3)	electronics	Electrical inspection	► Obligations of the operating company on page 11 ► Electrical system on page 20

7.2.1 Recommended wear and tears parts

Drive V-belt assembly
Wiper on the guide tracks

7.3 Lubricating and cleaning the lathe chuck

ATTENTION!

Do not use compressed air to remove dust and foreign substances from the lathe chuck.

Coolant squirts on the lathe chuck and removes the grease from the master jaws. In order to maintain the tensioning force and the long-term accuracy of the lathe chuck, the lathe chuck must be lubricated regularly. Insufficient lubrication will result in malfunctions at reduced tensioning force, which affects the accuracy and causes excessive wear and seizing.

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Depending on the chuck type and operating state, the tensioning force of a lathe chuck can decrease by up to 50 percent of the nominal tensioning force.

A presumably securely clamped workpiece can then fall out of the chuck during processing.

Lubricate the lathe chuck at the worm and at the lubricating nipple. Lubricate the lathe chuck at least once per week. The used lubricant should be of high quality and provided for high pressure bearing surfaces. The lubricant should withstand the coolant and other chemicals.

Numerous different lathe chucks are available on the market which distinguish themselves considerably based on the lubricating method. Follow the operating instructions of the corresponding lathe chuck manufacturer.

7.4 Repair

7.4.1 Customer service technician

For any repair work request the assistance of an authorised customer service technician. Contact your specialist dealer if you do not have customer service's information or contact Stürmer Maschinen GmbH in Germany who can provide you with a specialist dealer's contact information. Optionally, the

Stürmer Maschinen GmbH

Dr.-Robert-Pfleger-Str. 26

D- 96103 Hallstadt

can provide a customer service technician, however, the request for a customer service technician can only be made via your specialist dealer.

If the repairs are carried out by qualified technical personnel, they must follow the indications given in these operating instructions.

Optimum Maschinen Germany GmbH accepts no liability nor does it guarantee against damage and operating malfunctions resulting from failure to observe these operating instructions.

For repairs only use

- faultless and suitable tools,
- original parts or parts from series expressly authorised by Optimum Maschinen Germany GmbH.

7.5 Cooling lubricants and tanks

CAUTION!

The cooling lubricant can cause diseases. Avoid direct contact with cooling lubricant or parts covered in cooling lubricant.

Cooling lubricant circuits and tanks for water-cooling lubricant mixtures must be completely emptied, cleaned and disinfected as needed, but at least once per year or every time the cooling lubricant is replaced.

If fine chips and other foreign matters are accumulated in the coolant tank, the machine can no longer be correctly supplied with coolant. Furthermore, the lifetime of the coolant pump is reduced.

When processing cast iron or similar materials generating fine chips, cleaning the coolant tank more often is recommended.

Limit values

The cooling lubricant must be replaced, the cooling lubricant circuit and tank emptied, cleaned and disinfected if

- O the pH value drops by more than 1 based on the value during initial filling. The maximum permissible pH value during initial filing is 9.3
- O there is a perceivable change in the appearance, odour, floating oil or increase of the bacteria to more than 10/6/ml
- O there is an increase in nitrite content to more than 20 ppm (mg/1) or nitrate content to more than 50 ppm (mg/1)
- O there is an increase in the N-nitrosodiethanolamine (NDELA) to more than 5 ppm (mg/a)

CAUTION!

Comply with the manufacturer's specifications for mixture ratios, hazardous substances, e.g. system cleaners, including their permissible minimum use times.

CAUTION!

Since the cooling lubricant escapes under high pressure, pumping out the coolant by using the existing cooling lubricant pump via a pressure hose into a suitable tank is not recommended.

ENVIRONMENTAL PROTECTION

During work on the cooling lubricant equipment please make sure that

- ▫ **collector tanks are used with sufficient capacity for the amount of liquid to be collected.**
- ▫ **liquids and oils should not be spilled on the ground.**

Clean up any spilled liquid or oils immediately using proper oil-absorption methods and dispose of them in accordance with current statutory environmental regulations.

Collect leakages

Do not re-introduce liquids spilled outside the system during repair or as a result of leakage from the reserve tank, instead collect them in a collecting container for disposal.

Disposal

Never dump oil or other substances which are harmful to the environment into water inlets, rivers or channels. Used oils must be delivered to a collection centre. Consult your supervisor if you do not know where the collection centre is.

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7.5.1 Inspection plan for water-mixed cooling lubricants

Company: No.: Date: used cooling lubricant			
size to be checked	Inspection methods	Inspection intervals	Procedure and comment
noticeable changes	Appearance, odour	daily	Find and rectify causes, e.g. skim off oil, check filter, ventilate cooling lubricant system
pH value	Laboratory techniques electrometric with pH meter (DIN 51369) Local measurement method: with pH paper (Special indicators with suitable measuring range)	weekly [1)]	if pH value decreases > 0.5 based on initial filing: Measures in accordance manufacturer's recommendations > 1.0 based on initial filing: Replace cooling lubricant, clean cooling lubricant circulation system
Usage concentration	Manual refractometer	weekly [1)]	Method results in incorrect values with tramp oil content
Base reserve	Acid titration in accordance with Manufacturer's recommendation	as required	Method is independent of tramp oil content
Nitrite content	Test sticks method or laboratory method	weekly [1)]	> 20 mg/L nitrite: Replace cooling lubricant or part or inhibiting additives; otherwise NDELA (N-nitrosodiethanolamine) in the cooling lubricant system and in the air must be determined > 5 mg/L NDELA in the cooling lubricant system: Replacement, clean and disinfect cooling lubricant circulation system, find nitrite source and, if possible, rectify.
Nitrate/nitrite content of the preparation water, if this is not removed from the public grid	Test sticks method or laboratory method	as required	Use water from the public grid if there is water from the pubic grid has > 50 mg/l nitrate: Inform the waterworks

[1)] The specified inspection intervals (frequency) are based on continuous operation. Other operational conditions can result in other inspection intervals; exceptions are possible in accordance with Sections 4.4 and 4.10 of the TGS 611.

Editor:

Signature:

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8 Ersatzteile - Spare parts

8.1 Ersatzteilbestellung - *Ordering spare parts*

Bitte geben Sie folgendes an - *Please indicate the following :*

- Seriennummer - *Serial No.*
- Maschinenbezeichnung - *Machines name*
- Herstellungsdatum - *Date of manufacture*
- Artikelnummer - *Article no.*

Die Artikelnummer befindet sich in der Ersatzteilliste. *The article no. is located in the spare parts list.* Die Seriennummer befindet sich am Typschild. *The serial no. is on the rating plate.*

8.2 Hotline Ersatzteile - Spare parts Hotline

+49 (0) 951-96555 -118

ersatzteile@stuermer-maschinen.de

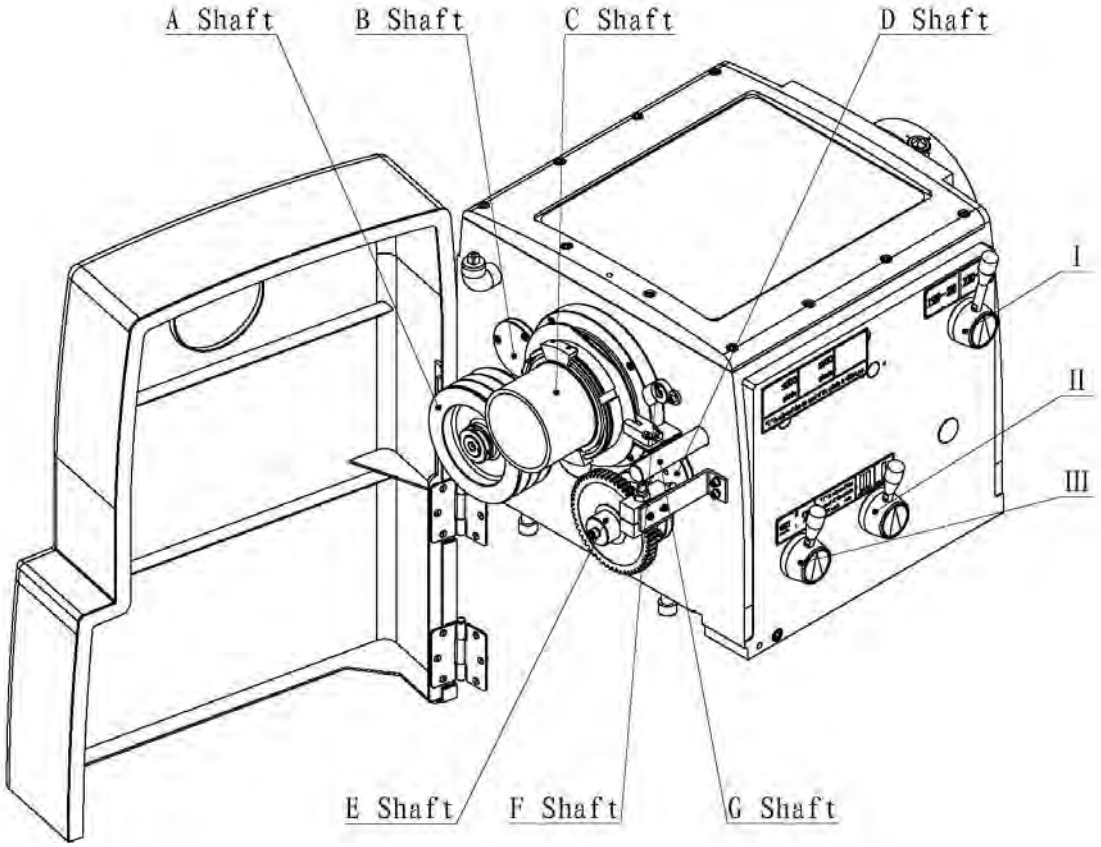
8.3 Service Hotline

+49 (0) 951-96555 -100

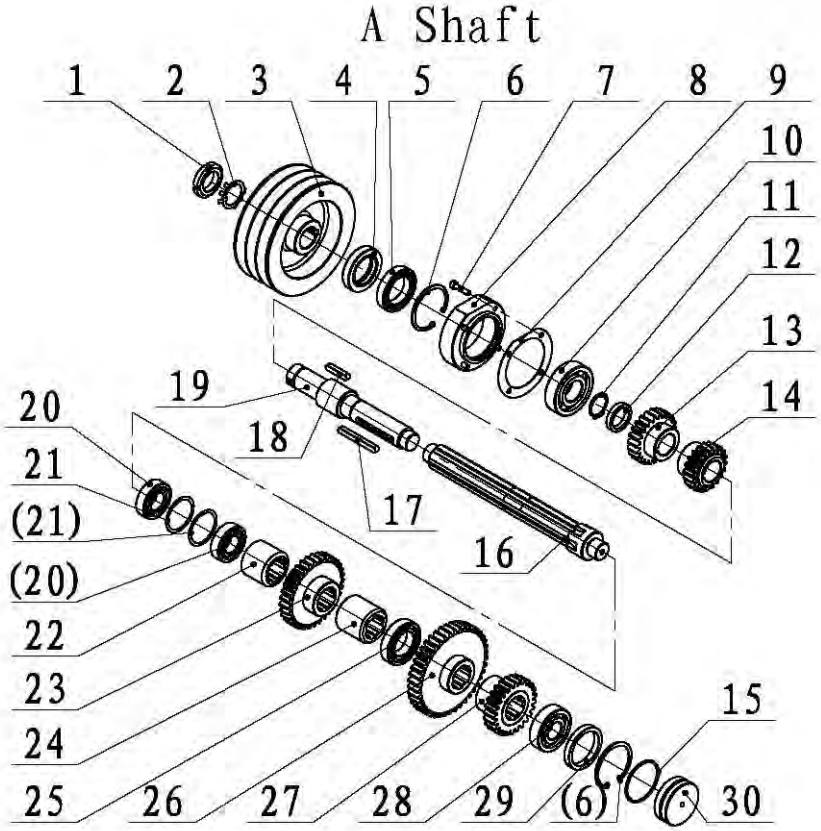
service@stuermer-maschinen.de

8.4 Ersatzteilzeichnungen - Spare part drawings

A Spindelstock Übersicht - Headstock overview



B **Spindelstock 1 von 9 - Headstock 1 of 9**



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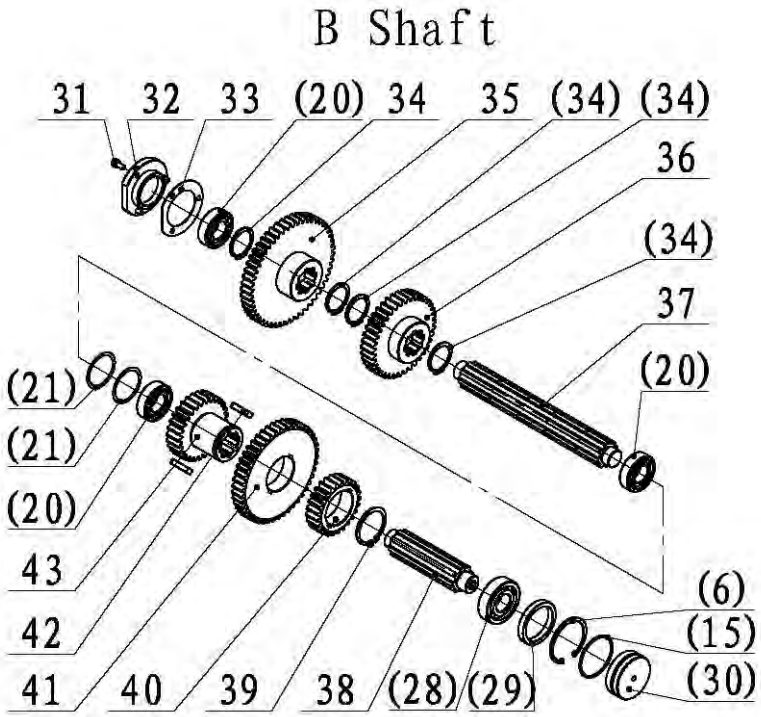

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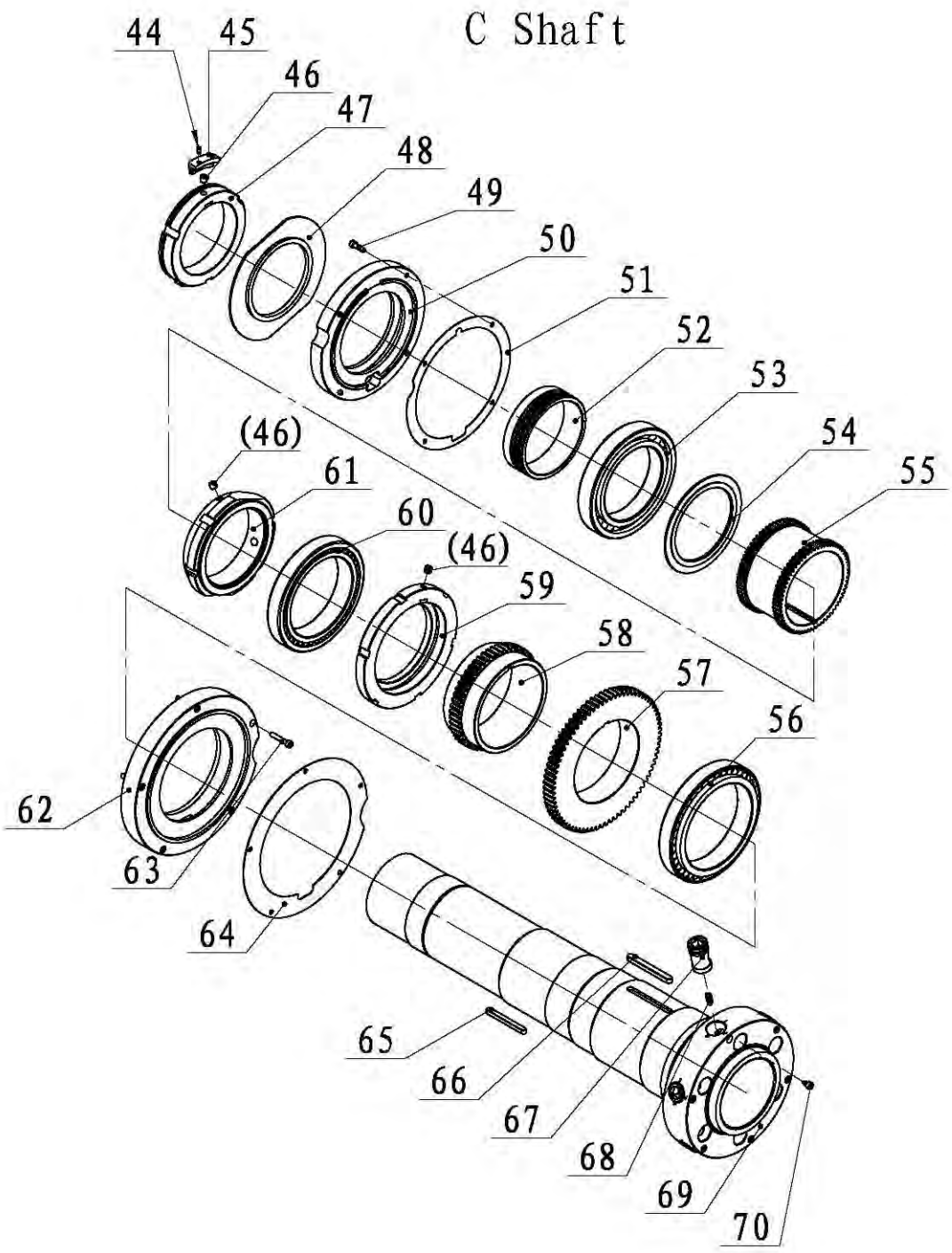
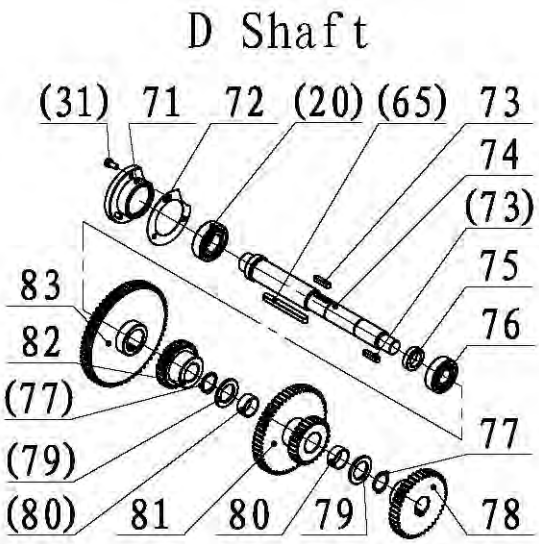
D Spindelstock 3 von 9 - Headstock 3 of 9



E **Spindelstock 4 von 9 - Headstock 4 of 9**



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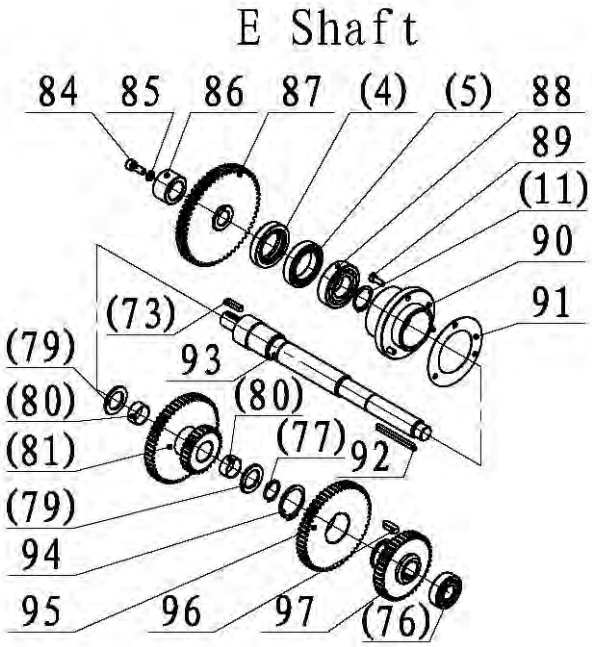

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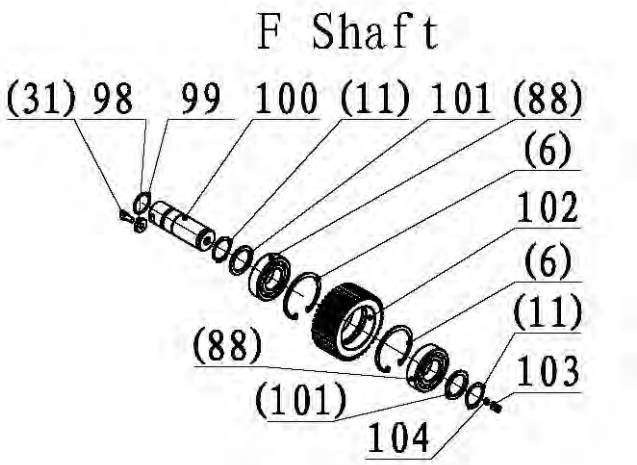
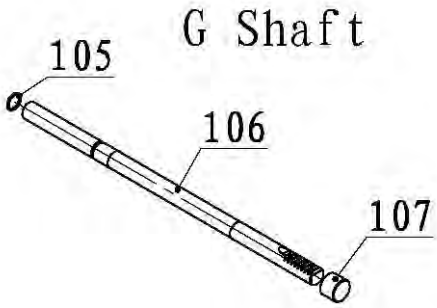
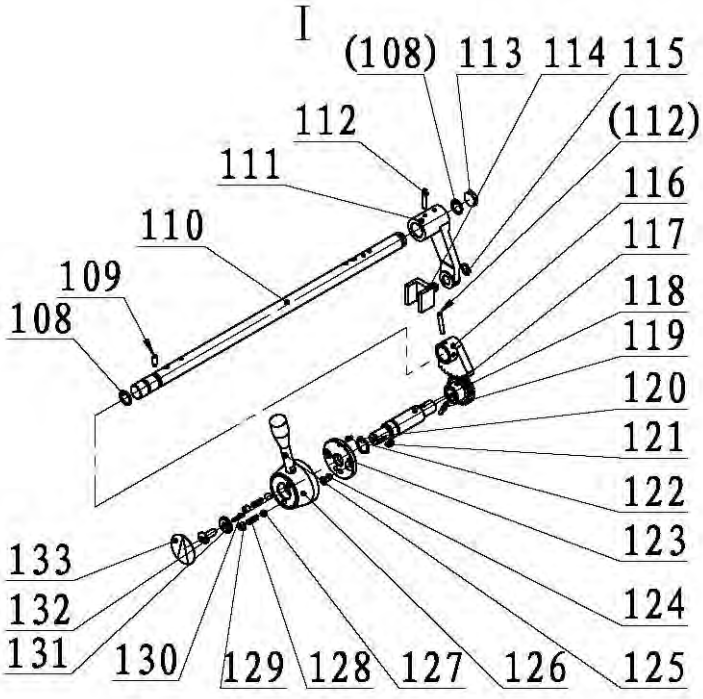
G Spindelstock 6 von 9 - Headstock 6 of 9



H Spindelstock 7 von 9 - Headstock 7 of 9



I Spindelstock 8 von 9 - Headstock 8 of 9



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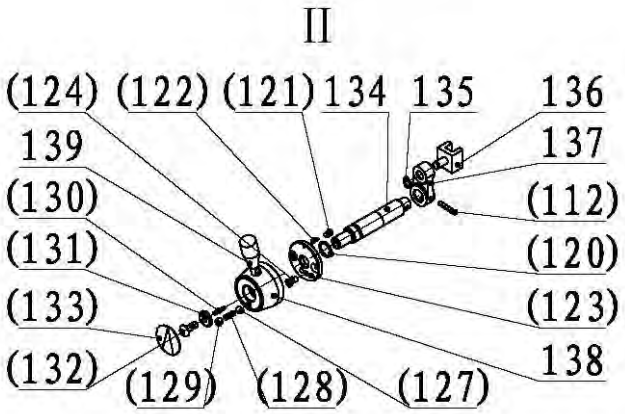
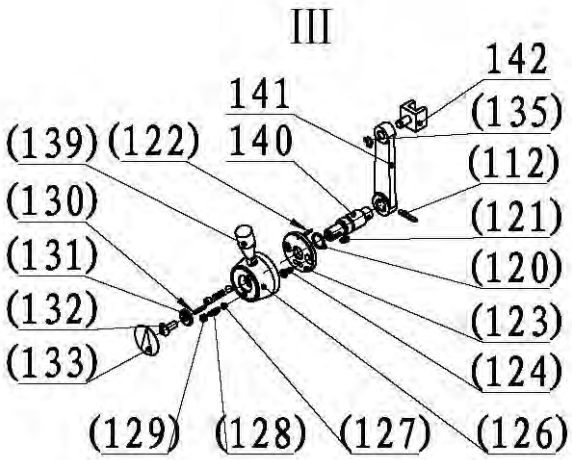
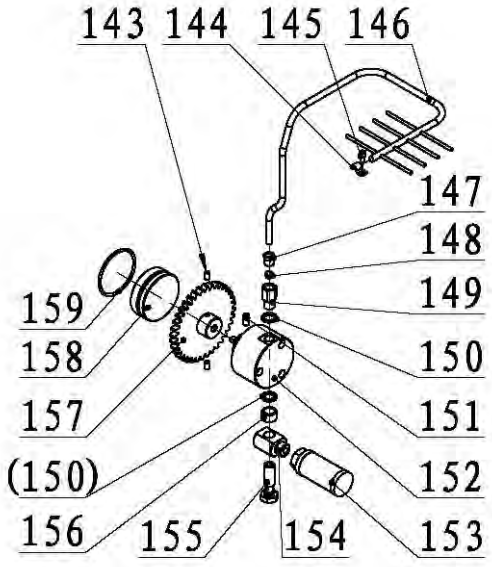
J Spindelstock 9 von 9 - Headstock 9 of 9







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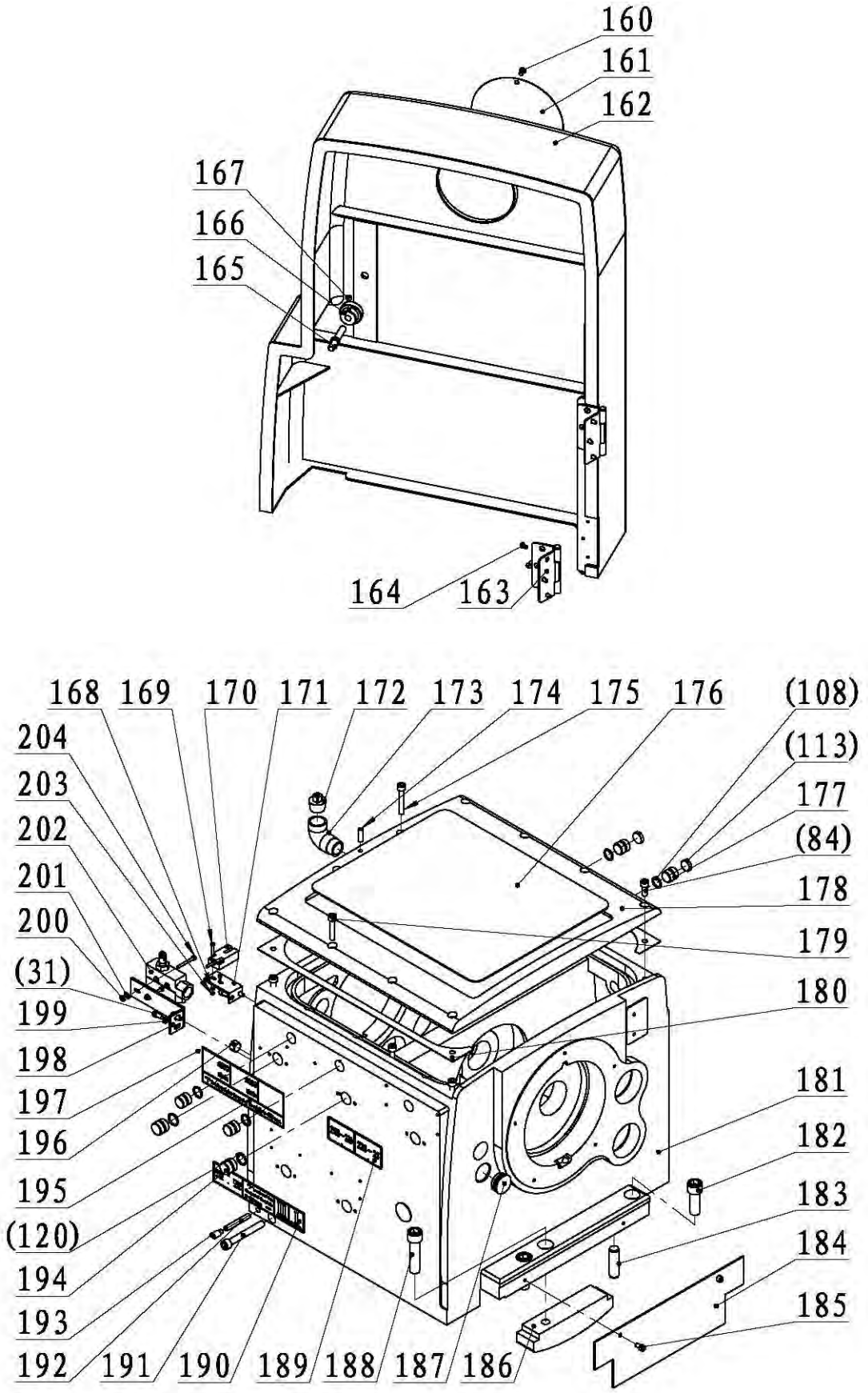

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Ersatzteilliste Spindelstock - Spare part list headstock						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1	Mutter	Nut	1	M30×1.5	GB/T 812-1988	034621751101
2	Unterlegscheibe	Washer	1	30	GB 858-1988	034621751102
3	Riemenscheibe	Pulley	1		C6241V-04-09	034621751103
4	Öldichtung	Oil Seal	2	TC40×62×12		034621751104
5	Kugellager	Ball Bearing	2	61908-2Z	GB/T276-1994	034621751105
6	Sicherungsring	Snap Ring	5	62	GB/T893.1-86	034621751106
7	Schraube	Screw	4	M6×25	GB/T70.1-2000	
8	Lagerdeckel	Bearing Cover	1		C6246B-101024	034621751108
9	Perlenmatte	Bealed Mat	1		C6246B-101024-1	034621751109
10	Kugellager	Ball Bearing	1	6306-2Z	GB/T276-1994	034621751110
11	Sicherungsring	Snap Ring	4	30	GB/T894.1-1986	034621751111
12	Unterlegscheibe	Washer	1		C6246B-101025	034621751112
13	Zahnrad	Gear	1		C6256EV-04-09	034621751113
14	Zahnrad	Gear	1		C6256E-04-08	034621751114
15	O-Ring	O-Ring	2	56×2.65	GB/T3452.1	034621751115
16	Welle	Shaft	1		C6246B-101035A	034621751116
17	Passfeder	Key	1	8×70	GB1096-79	034621751117
18	Passfeder	Key	1	8×40	GB1096-79	034621751118
19	Welle	Shaft	1		C6246B-101080	034621751119
20	Kugellager	Ball Bearing	6	6205-2Z	GB/T276-1994	034621751120
21	Unterlegscheibe	Washer	4		C6246B-101028	034621751121
22	Distanzstück	Spacer	1		C6256EV-04-07	034621751122
23	Zahnrad	Gear	1		C6256E-04-06	034621751123
24	Distanzstück	Spacer	1		C6256EV-04-05	034621751124
25	Kugellager	Ball Bearing	1	6007-2Z	GB/T276-1994	034621751125
26	Zahnrad	Gear	1		C6256EV-04-04	034621751126
27	Zahnrad	Gear	1		C6256E-04-03	034621751127
28	Kugellager	Ball Bearing	2	6305-2Z	GB/T276-1994	034621751128
29	Unterlegscheibe	Washer	2		C6246B-101034-2	034621751129
30	Verschlusskappe	Plug	2		RUN6246-101019-1	034621751130
31	Schraube	Screw	11	M6×12	GB/T70.1-2000	034621751131
32	Abdeckung	Cover	1		C6246B-101079	034621751132
33	Dichtscheibe	Sealed Mat	1		C6246B-101079-1	034621751133
34	Sicherungsring	Snap Ring	4	38	GB/T894.1-1986	034621751134
35	Zahnrad	Gear	1		C6256EV-04-17	034621751135
36	Zahnrad	Gear	1		C6256EV-04-14	034621751136
37	Welle	Shaft	1		C6256EV-04-60	034621751137
38	Welle	Shaft	1		C6256E-04-10	034621751138
39	Sicherungsring	Snap Ring	1	50	GB/T894.1-1986	034621751139
40	Zahnrad	Gear	1		C6256EV-04-11-2	034621751140
41	Zahnrad	Gear	1		C6256EV-04-12	034621751141
42	Passfeder	Key	2	8×36	GB1096-79	034621751142
43	Zahnrad	Gear	1		C6256EV-04-11-1	034621751143
44	Schraube	Screw	4	M6×10	GB/T79-2000	
45	Ausgleichsstück	Balance Piece	2		C6266A-04-71	034621751145
46	Schraube	Screw	5	M10×10	GB/T77-2000	
47	Mutter	Nut	1		C6266A-04-32	034621751147
48	Platte	Plate	1		C6256EV-04-62-1?-2	034621751148
49	Schraube	Screw	4	M6×20	GB/T70.1-2000	
50	Rückseitiger Lagerdeckel	Rear Bearing Cover	1		C6256E-04-26	034621751150
51	Dichtscheibe	Sealed Mat	1		C6256E-04-26-01	034621751151
52	Zyklus Ol Ring	Cycle Oil Ring	1		C6256E-04-25	034621751152
53	Kugellager	Ball Bearing	1	6024-2Z	GB/T276-1994	034621751153
54	Ol Ring	Oil Ring	1		C6256E-04-24	034621751154
55	Zahnrad	Gear	1		C6256E-04-23	034621751155
56	Kegelrollenlager	Taper Roller	1	32928/P5	GB/T297-1994	034621751156
57	Zahnrad	Gear	1		C6256E-04-20	034621751157
58	Zahnrad	Gear	1		C6256E-04-21	034621751158
59	Einstellmutter	Set Nut	1		C6256E-04-22	034621751159
60	Kegelrollenlager	Taper Roller	1	32926/P5	GB/T297-1994	034621751160
61	Einstellmutter	Set Nut	1		C6266A-04-31	034621751161
62	Vorderer Lagerdeckel	Front Bearing Cover	1		C6256E-04-19	034621751162
63	Schraube	Screw	5	M6×35	GB/T70.1-2000	
64	Dichtscheibe	Sealed Mat	1		C6256E-04-19-1	034621751164
65	Passfeder	Key	2	8×80	GB1096-79	034621751165
66	Passfeder	Key	1	10×90	GB1096-79	034621751166
67	Verriegelungsnocken	Cam Lock	6		C6266A-04-76	034621751167
68	Feder	Spring	6		RUN6246-101082-1	034621751168
69	Spindel	Spindle	1		C6256E-04-02	034621751169
70	Schraube	Screw	6		C6266A-04-77	034621751170
71	Abdeckung	Cover	1		C6246B-101067	034621751171
72	Dichtscheibe	Sealed Mat	1		C6246B-101067-1	034621751172

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Ersatzteilliste Spindelstock - Spare part list headstock						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
73	Passfeder	Key	3	6×28	GB1096-79	034621751173
74	Welle	Shaft	1		C6256E-04-34	034621751174
75	Distanzstück	Spacer	1		RUN6246-101050	034621751175
76	Kugellager	Ball Bearing	2	6204-2Z	GB/T276-1994	034621751176
77	Sicherungsring	Snap Ring	3	25	GB/T894.1-1986	034621751177
78	Zahnrad	Gear	1		C6256E-04-33	034621751178
79	Distanzstück	Spacer	4		RUN6141-101091	034621751179
80	Lager	Bearing	4	2512	SF-1	034621751180
81	Zahnrad	Gear	1		C6256E-04-27	034621751181
82	Zahnrad	Gear	1		C6256E-04-32	034621751182
83	Zahnrad	Gear	1		C6256E-04-31	034621751183
84	Schraube	Screw	5	M8×20	GB/T70.1-2000	034621751184
85	Unterlegscheibe	Washer	1	8	GB/T93-1987	
86	Unterlegscheibe	Washer	1		RUN6141-108002	034621751186
87	Zahnrad	Gear	1		C6256A-04-03	034621751187
88	Kugellager	Ball Bearing	3	6206-2Z	GB/T276-1994	034621751188
89	Schraube	Screw	3	M6×16	GB/T70.1-2000	
90	Lagerflansch	Bearing Flanged	1		C6246B-101063	034621751190
91	Dichtscheibe	Sealed Mat	1		C6246B-101063-1	034621751191
92	Passfeder	Key	1	6×70	GB1096-79	034621751192
93	Welle	Shaft	1		C6256E-04-30	034621751193
94	Sicherungsring	Snap Ring	1	42	GB/T894.1-1986	034621751194
95	Zahnrad	Gear	1		C6256E-04-28	034621751195
96	Passfeder	Key	1	8×25	GB1096-79	034621751196
97	Zahnrad	Gear	1		C6256E-04-29	034621751197
98	Unterlegscheibe	Washer	1		RUN6246-101048	034621751198
99	O-Ring	O-Ring	1	30×2.4	GB1235-76	034621751199
100	Welle	Shaft	1		C6246B-101061	0346217511100
101	Distanzstück	Spacer	2		C6246B-101059	0346217511101
102	Zahnrad	Gear	1		C6256E-04-35	0346217511102
103	Verbindung	Connection	1	15326C		0346217511103
104	Bipyramid	Bipyramid	1	B1061C		0346217511104
105	O-Ring	O-Ring	1	20×2.65	GB/T3452.1	0346217511105
106	Welle	Shaft	1		C6256EV-04-61	0346217511106
107	Verschlusskappe	Plug	1		C6241V-04-19	0346217511107
108	O-Ring	O-Ring	6	20×2.4	GB1235-76	0346217511108
109	Schraube	Screw	1	M6×16	GB/T79-2000	
110	Welle	Shaft	1		C6246B-101023	0346217511110
111	Hebel	Lever	1		C6256E-04-38	0346217511111
112	Federstift	Spring Pin	4	5×30	GB879-86	0346217511112
113	Verschlusskappe	Plug	3		RUN6246-101083	0346217511113
114	Gabel	Fork	1		C6256E-04-39	0346217511114
115	Sicherungsring	Snap Ring	1	12	GB/T894.1-1986	0346217511115
116	Zahnrad	Gear	1		C6256E-04-43	0346217511116
117	Zahnrad	Gear	1		C6256E-04-44	0346217511117
118	Welle	Shaft	1		RUN6246-101065	0346217511118
119	Federstift	Spring Pin	1	5×26	GB879-86	0346217511119
120	O-Ring	O-Ring	5	22×2.4	GB1235-76	0346217511120
121	Passfeder	Key	3	5×12	GB1096-79	0346217511121
122	Federstift	Spring Pin	3	3×12	GB879-86	
123	Fix Schwarz	Fix Black	3		RUN6246-101067	0346217511123
124	Schraube	Screw	6	M6x14	GB819-85	
125	Hebel	Lever	1		RUN6246-101072-1	0346217511125
126	Griff	Handle	1		RUN6246-101077A	0346217511126
127	Stahlkugel	Steel Ball	5	8	GB308-84	0346217511127
128	Feder	Spring	5		RUN6246-101066	0346217511128
129	Schraube	Screw	5	M8×8	GB/T77-2000	
130	Schraube	Screw	3	M4×20	GB/T80-2000	
131	Unterlegscheibe	Washer	3		RUN6246-101070-1	0346217511131
132	Schraube	Screw	3		RUN6246-101088	0346217511132
133	Platte	Plate	3		RUN6246-101099	0346217511133
134	Welle	Shaft	1		C6256E-04-45	0346217511134
135	Sicherungsring	Snap Ring	2	10	GB/T894.1-1986	
136	Gabel	Fork	1		C6256E-04-50	0346217511136
137	Hebel	Lever	1		C6256E-04-47	0346217511137
138	Hebel Kopf	Lever Head	1		RUN6246-101071	0346217511138
139	Hebel	Lever	2		RUN6246-102056-2	0346217511139
140	Welle	Shaft	1		C6256E-04-48	0346217511140
141	Hebel	Lever	1		C6256E-04-46	0346217511141
142	Gabel	Fork	1		C6256E-04-49	0346217511142
143	Schraube	Screw	2	M6×12	GB/T80-2000	
144	Rohr klemme	Pipe Clip	1	25594-1		0346217511144

Ersatzteilliste Spindelstock - Spare part list headstock						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
145	Schraube	Screw	1	M5×10	GB/T70.1-2000	
146	Ölleitung	Oil Pipe	1		C6251A-04-06	0346217511146
147	Verbindung	Connection	1	25567	25567	0346217511147
148	Bipyramid	Bipyramid	1	B145C	B145C	0346217511148
149	Verbindung	Connection	1		C6246B-101086	0346217511149
150	Dichtungsscheibe	Sealing Washer	2	14	G52-2	0346217511150
151	Schraube	Screw	1	M8×16	GB/T80-2000	
152	Pumpe	Pump	1	SNBY2.5-0.5	SNBY2.5-0.5	0346217511152
153	Filter	Fuel Filter	1	WU-16-180-J	WU-16-180-J	0346217511153
154	Verbindung	Connection	1	M18	C6246E-04-110	0346217511154
155	Verbindung	Connection	1	M14	C6246E-04-112	0346217511155
156	Distanzstück	Spacer	1		C6246E-04-111	0346217511156
157	Zahnrad	Gear	1		C6256EV-04-18	0346217511157
158	Verschlusskappe	Plug	1		C6246B-101082	0346217511158
159	O-Ring	O-Ring	1	68×3.1	GB1235-76	0346217511159
160	Schraube	Screw	1	M6×10	GB/T70.2-2000	
161	Abdeckung	Cover	1		C6251A-04-05	0346217511161
162	Endabdeckung	Cover End	1		C6256E-04-54	0346217511162
163	Scharnier	Hinge	1	100	GB7277-87	0346217511163
164	Schraube	Screw	12	M5×10	GB/T68-2000	
165	Schraube	Screw	1		RUN6246-108074	
166	Mutter	Nut	1		RUN6246-108073	0346217511166
167	Schraube	Screw	1	M6×8	GB/T80-2000	
168	Unterlegscheibe	Washer	2	3	GB/I97.1-1985	
169	Schraube	Screw	2	M3×20	GB/T70.1-2000	
170	Geschwindigkeitsüberwachung	Speed monitor	1			0346217511170
171	Schalterhalterung	Switch Bracket	1		C6241V-04-12	0346217511171
172	Verschlusskappe	Plug	1	20	SB4032-65	0346217511172
173	Rohrverschraubung	Tube Fitting	1	20	SB4010-65	0346217511173
174	Schraube	Screw	1	M8×25	GB/T77-2000	
175	Schraube	Screw	2	M8×50	GB/T70.1-2000	
176	Verkleidung	Cover Dress	1		C6246B-101003	0346217511176
177	Verschlusskappe	Plug	4		C6241V-04-10	0346217511177
178	Spindelstock Abdeckung	Headstock Cover	1		C6246B-101002	0346217511178
179	Schraube	Screw	4	M8×40	GB/T70.1-2000	
180	Dichtscheibe	Sealed Mat	1		C6246B-101002-1	0346217511180
181	Spindelstock Gusskörper	Headstock Casting	1		C6256EV-04-01	0346217511181
182	Schraube	Screw	4	M16×45	GB/T70.1-2000	
183	Stift	Pin	1	16×55	GB/T120.1-2000	
184	Bettschlitten Schürze	Apron	1		C6251D-04-03	0346217511184
185	Schraube	Screw	2	M6×10	GB/T70.1-2000	
186	Schelle	Clamp	1		C6251D-04-04	0346217511186
187	Olschauglas	Oil Sight Glass	2	A20	GB1160.1-89	0346217511187
188	Schraube	Screw	1	M16×65	GB/T70.1-2000	
189	Platte	Plate	1		C6256EV-04-63	0346217511189
190	Platte	Plate	1		C6256E-04-51	0346217511190
191	Schraube	Screw	1	M10×80	GB/T70.1-2000	
192	Stift	Pin	1	8×55	GB119-86	
193	Schraube	Screw	1	M10×20	GB/T79-2000	
194	Stecker	plug	2		C6241V-04-11	0346217511194
195	Platte	Plate	1		C6241V-04-15	0346217511195
196	Ölverschluss	Oil Plug	1	Z3/8″	G38-3A	0346217511196
197	Niet	Rivet	16	2×5	GB/T827-1986	0346217511197
198	Schalterhalterung	Switch Bracket	1		C6241V-04-17	0346217511198
199	Unterlegscheibe	Washer	2	6	GB/T97.1-1985	
200	Mutter	Nut	2	M4	GB/T6170-2000	
201	Unterlegscheibe	Washer	2	4	GB/T97.1-1985	
202	Schalter	Switch	1			0346217511202
203	Mutter	Nut	2	M3	GB/T6170-2000	
204	Schraube	Screw	2	M4×25	GB/T70.1-2000	

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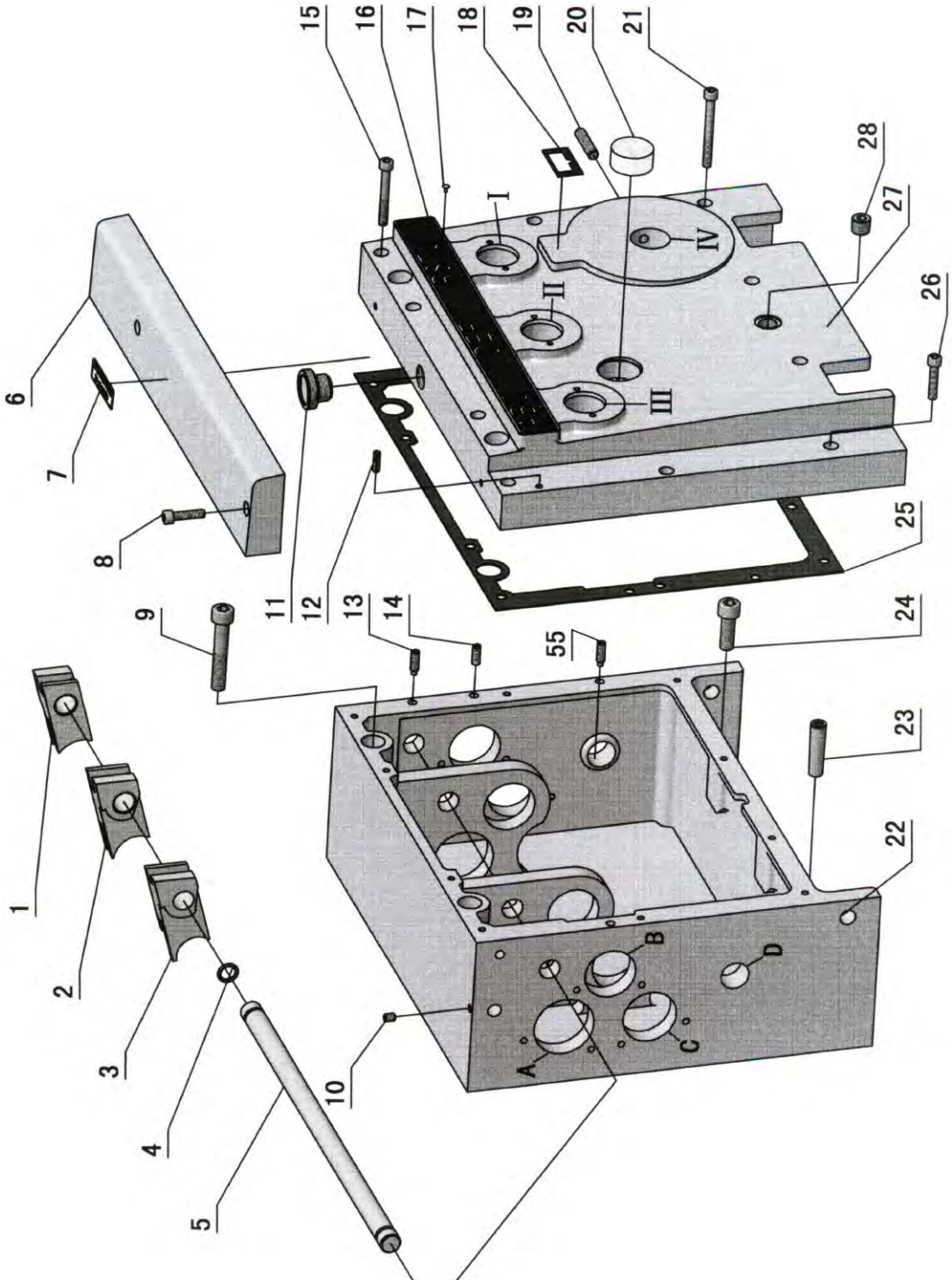
L Vorschubgetriebe 1 von 4 - Headstock feed gear 1 of 4



Img.8-1: Vorschubgetriebe 1 von 4 - Headstock feed gear 1 of 4

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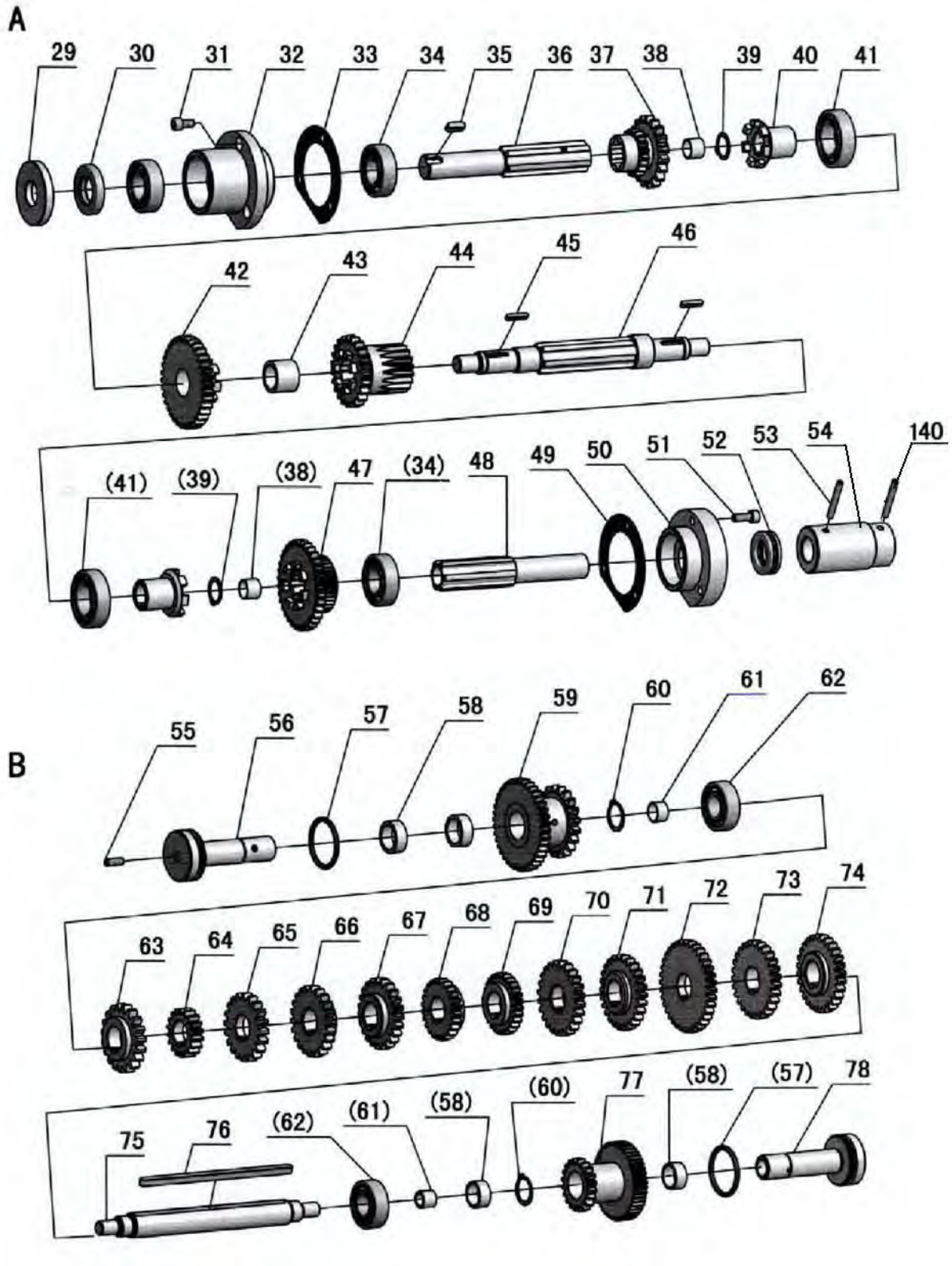
M Vorschubgetriebe 2 von 4 - Headstock feed gear 2 of 4



Img.8-2: Vorschubgetriebe 2 von 4 - Headstock feed gear 2 of 4

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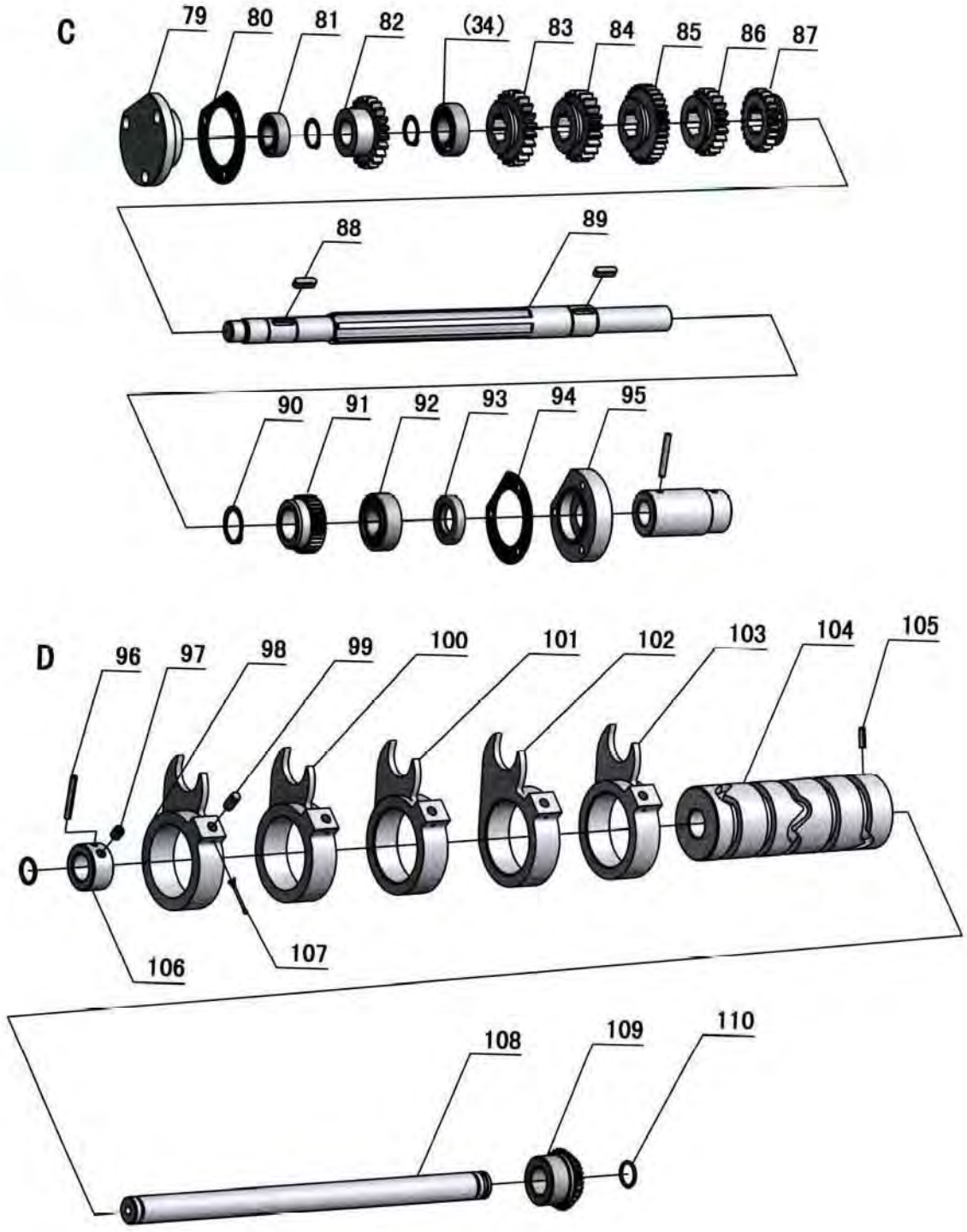
N Vorschubgetriebe 3 von 4 - Feed gear 3 of 4



Img. 8-3: Vorschubgetriebe 3 von 4 - Headstock feed gear 3 of 4

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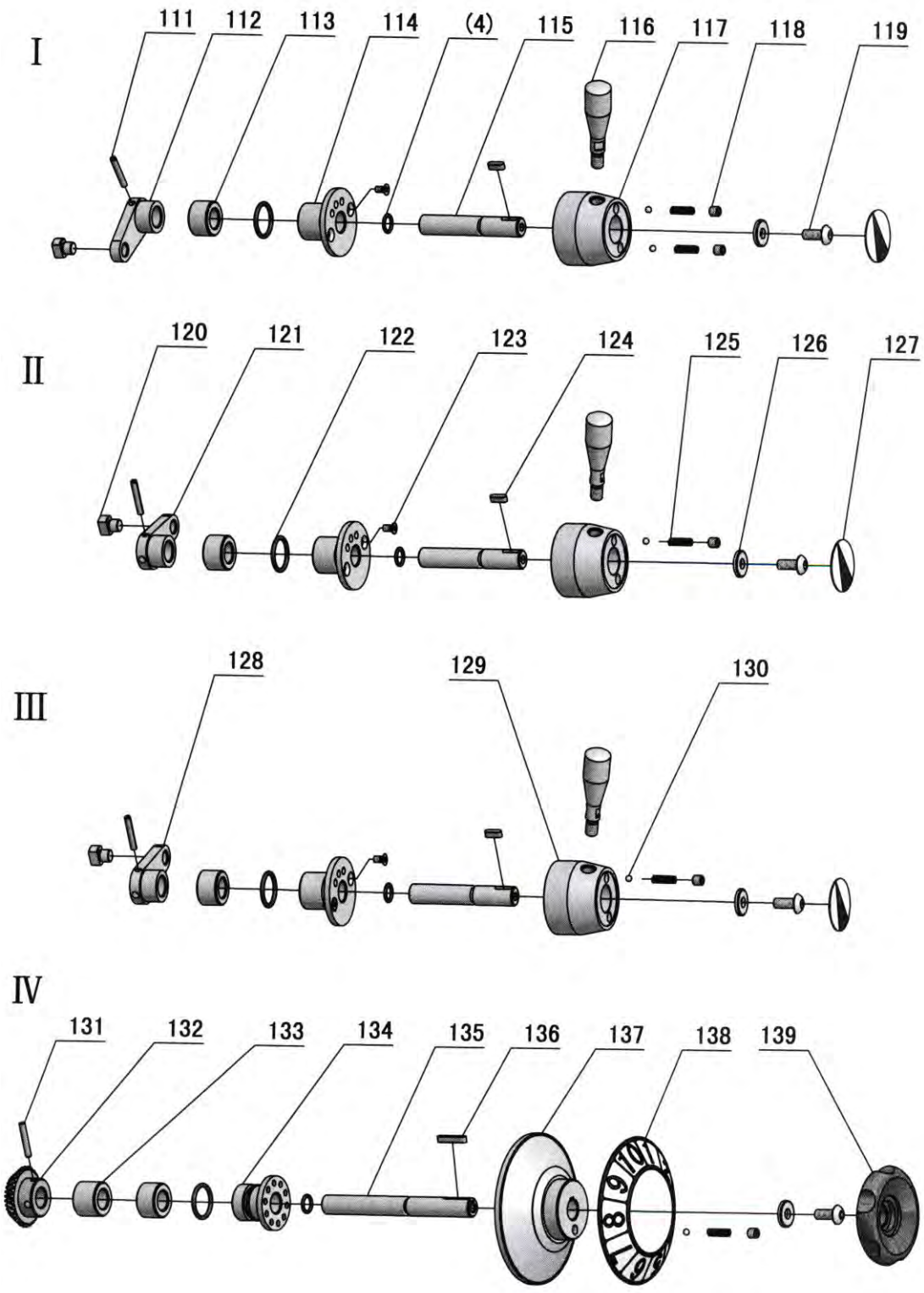
O Vorschubgetriebe 4 von 4 - Feed gear 4 of 4



Img.8-4: Vorschubgetriebe 4 von 4 - Headstock feed gear 4 of 4

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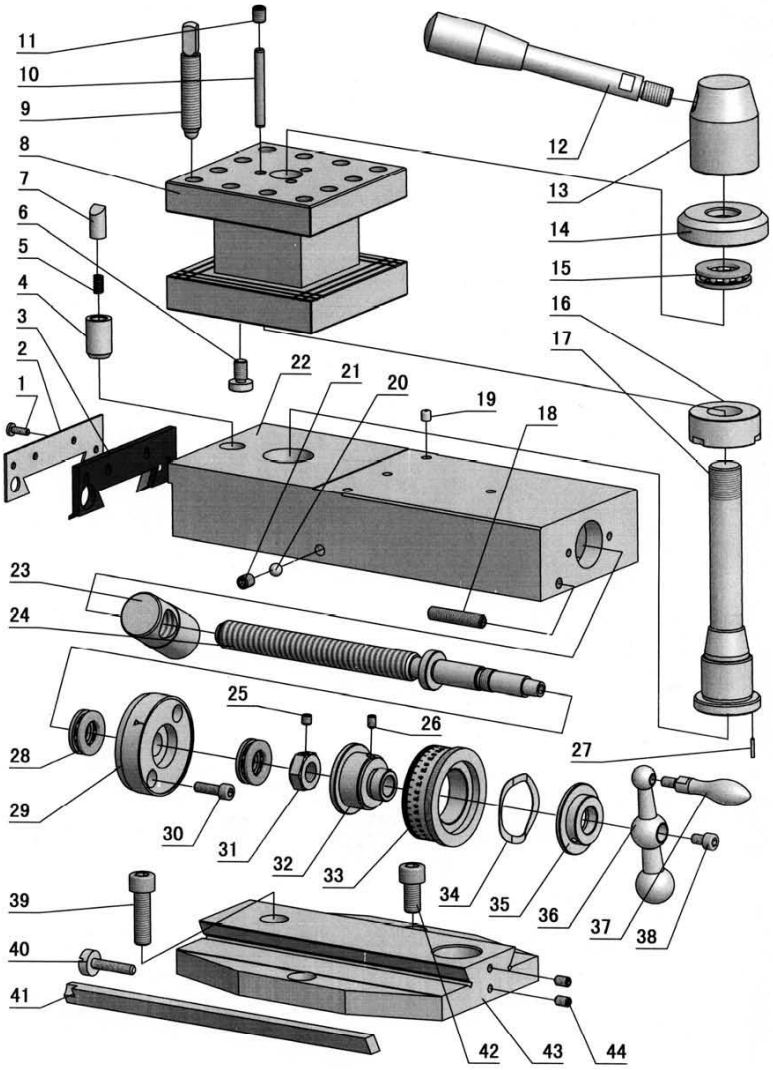
Ersatzteilliste Vorschubgetriebe - Spare part list headstock feed gear						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1	Gabel	Fork	1		RUN6141-102070-1	034621752201
2	Gabel	Fork	1		RUN6246-102069	034621752202
3	Gabel	Fork	1		RUN6246-102069-1	034621752203
4	O-Ring	O-Ring	6	16×2.4	GB1235-76	034621752204
5	Welle	Shaft	1		RUN6246-102077	034621752205
6	Obere Abdeckung	Top Cover	1		C6246E-05-05	034621752206
7	Platte	Plate	1		RUN6246-101108	034621752207
8	Schraube	Screw	2	M6×28	GB70-85	034621752208
9	Schraube	Screw	2	M10×60	GB70-85	034621752209
10	Schraube	Screw	1	M6×8	GB78-85	034621752210
11	Olabdeckung	Oil Cover	1		RUN6246-103031	034621752211
11	Platte	Plate	1		RUN6246-103031-1	0346217522111
12	Federstift	Spring Pin	2	5×16	GB879-86	034621752212
13	Stiftschraube	Socket Set Screw	1	M6×16	GB78-85	
14	Schraube	Screw	2	M6×16	GB78-85	
15	Schraube	Screw	4	M6×50	GB70-85	
16	Platte	Plate	1		RUN6246-102080B	034621752216
17	Niet	Rivet	14	2×5	GB827-86	034621752217
18	Platte	Plate	1		RUN6246-102081	034621752218
19	Schraube	Screw	1	M8×35	GB78-85	
20	Olschauglas	Oil Sight Glass	1	20	GB1160.1-89	034621752220
21	Schraube	Screw	3	M6×60	GB70-85	
22	Getriebekasten	Gear Box	1		RUN6246-102001A	034621752222
23	Kegelstift	Taper Pin	2	8×30	GB118-86	
24	Schraube	Screw	2	M10×30	GB70-85	
25	Dichtscheibe	Sealed Mat	1		RUN6246-102001-2A	034621752225
26	Schraube	Screw	3	M6×30	GB70-85	
27	Vordere Abdeckung	Front Cover	1		RUN6141-102002A	034621752227
28	Olverschluss	Oil Plug	1	Z 3/8"	G38-3A	034621752228
29	Distanzstück	Spacer	1		RUN6246-102052	034621752229
30	Öldichtung	Oil-Seal	1	TC20×42×8		034621752230
31	Zylinderkopfschraube	Socket Head Cap Screw	6	M6×12	GB70-85	
32	Kappe	Cap	1		RUN6246-102050	034621752232
33	Dichtscheibe	Sealed Mat	1		RUN6246-102050-1	034621752233
34	Kugellager	Ball Bearing	3	80104	GB278-89	034621752234
35	Passfeder	Key	1	6×10	GB1096-79	034621752235
36	B - Welle	B-Shaft	1		RUN6246-102049	034621752236
37	Zahnrad	Gear	1		RUN6246-102048	034621752237
38	Kugellager	Ball Bearing	2	1410	SF-1	034621752238
39	Sicherungsring	Snap Ring	2	18	GB894.1-86	034621752239
40	Kupplung	Clutch	2		RUN6246-102047	034621752240
41	Kugellager	Ball Bearing	2	80105	GB278-89	034621752241
42	Zahnrad	Gear	1		RUN6246-102046	034621752242
43	Kugellager	Ball Bearing	1	2020	SF-1	034621752243
44	Zahnrad	Gear	1		RUN6246-102045	034621752244
45	Passfeder	Key	2	4×20	GB1096-79	034621752245
46	A-Welle	A-Shaft	1		RUN6246-102044	034621752246
47	Zahnrad	Gear	1		RUN6141-102042-1	034621752247
48	C-Welle	C-Shaft	1		RUN6246-102041	034621752248
49	Dichtscheibe	Sealed Mat	1		RUN6246-102040-1	034621752249
50	Kappe	Cap	1		RUN6246-102040	034621752250
51	Innensechskant Schraube	Socket Cap Screw	6	M6×20	GB70-85	
52	Drucklager	Thrust Bearing	1	8104	GB301-84	034621752252
53	Federstift	Spring Pin	1	5×35	GB879-86	
54	Kragen Gestänge	Collar-Linkage	2		RUN6246-102012	034621752254
55	Stiftschraube	Socket Set Screw	1	M6×20	GB79-85	034621752255
56	E-Welle	E-Shaft	1		RUN6246-102023	034621752256
57	O-Ring	O-Ring	2	35.5×3.55	GB3452.1-82	034621752257
58	Kugellager	Ball Bearing	4	2012	SF-1	034621752258
59	Zahnrad	Gear	1		RUN6246-102024	034621752259
60	Sicherungsring	Snap Ring	4	20	GB894.1-86	034621752260
61	Kugellager	Ball Bearing	2	1218	SF-1	034621752261
62	Kugellager	Ball Bearing	2	80203	GB278-89	034621752262
63	Zahnrad	Gear	1		RUN6246-102026	034621752263
64	Zahnrad	Gear	1		RUN6246-102027	034621752264
65	Zahnrad	Gear	1		RUN6246-102028	034621752265
66	Zahnrad	Gear	1		RUN6246-102029	034621752266
67	Zahnrad	Gear	1		RUN6246-102030	034621752267
68	Zahnrad	Gear	1		RUN6246-102031	034621752268
69	Zahnrad	Gear	1		RUN6246-102032	034621752269

Ersatzteilliste Vorschubgetriebe - Spare part list headstock feed gear						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
70	Zahnrad	Gear	1		RUN6246-102033	034621752270
71	Zahnrad	Gear	1		RUN6246-102034	034621752271
72	Zahnrad	Gear	1		RUN6246-102035	034621752272
73	Zahnrad	Gear	1		RUN6246-102036	034621752273
74	Zahnrad	Gear	1		RUN6246-102037	034621752274
75	D-Welle	D-Shaft	1		RUN6246-102025	034621752275
76	Passfeder	Key	1	6×146	GB1096-79	034621752276
77	Zahnrad	Gear	1		RUN6141-102038	034621752277
78	F-Welle	F-Shaft	1		RUN6246-102039	034621752278
79	Kappe	Cap	1		RUN6246-102022	034621752279
80	Dichtscheibe	Sealed Mat	1		RUN6246-102022-1	034621752280
81	Kugellager	Ball Bearing	1	80103	GB278-89	034621752281
82	Zahnrad	Gear	1		RUN6246-102020	034621752282
83	Zahnrad	Gear	1		RUN6246-102019	034621752283
84	Zahnrad	Gear	1		RUN6246-102018	034621752284
85	Zahnrad	Gear	1		RUN6246-102017	034621752285
86	Zahnrad	Gear	1		RUN6246-102016	034621752286
87	Zahnrad	Gear	1		RUN6246-102015	034621752287
88	Passfeder	Key	2	6×20	GB1096-79	034621752288
89	G-Welle	G-Shaft	1		RUN6246-102021	034621752289
90	Sicherungsring	Snap Ring	1	25	GB894.1-86	034621752290
91	Zahnrad	Gear	1		RUN6141-102014-1	034621752291
92	Kugellager	Ball Bearing	1	180204	GB279-88	034621752292
93	Öldichtung	Oil Seal	1	TC20×40×7		034621752293
94	Dichtscheibe	Sealed Mat	1		RUN6246-102013-1	034621752294
95	Kappe rechts	Cap-Right	1		RUN6246-102013	034621752295
96	Federstift	Spring Pin	1	5×35	GB879-86	
97	Stiftschraube	Socket Set Screw	1	M8×10	GB78-85	
98	Klauenschieber	Claw-Shifter	1		RUN6246-102008	034621752298
99	Stift	Pin	5	B8×16	GB119-86	
100	Klauenschieber	Claw-Shifter	1		RUN6246-102007	0346217522100
101	Klauenschieber	Claw-Shifter	1		RUN6246-102006	0346217522101
102	Klauenschieber	Claw-Shifter	1		RUN6246-102005	0346217522102
103	Klauenschieber	Claw-Shifter	1		RUN6246-102004	0346217522103
104	Nocke	Cam	1		RUN6246-102009	0346217522104
105	Federstift	Spring Pin	2	5×16	GB879-86	
106	fester Ring	Fixed Ring	1		RUN6246-102010	0346217522106
107	Splint	Split Pin	5	2×30	GB91-86	
108	Nockenwelle	Cam Shaft	1		RUN6246-102011	0346217522108
109	Kegelrad	Bevel Gear	1		RUN6246-102003	0346217522109
110	O-Ring	O-Ring	2	22×2.4	GB1235-76	0346217522110
111	Federstift	Spring Pin	3	5×30	GB879-86	
112	Arm	Arm	1		RUN6246-102066	0346217522112
113	Distanzstück	Spacer	4		RUN6141-102062-2	0346217522113
114	Rastplatte	Detent Plate	3		RUN6246-102075	0346217522114
115	Welle	Shaft	3		RUN6141-102072	0346217522115
116	Hebel	Lever	3		RUN6246-102056-2	0346217522116
117	Griff Drehzahlwechsel	Speed Change Handle	1		RUN6246-102076	0346217522117
118	Schraube	Screw	5	M8×8	GB77-85	
119	Schraube	Screw	4		RUN6246-101088	0346217522119
120	Gabel	Fork	3		RUN6246-102073	0346217522120
121	Arm	Arm	1		RUN6246-102067	0346217522121
122	O-Ring	O-Ring	4	30×3.1	GB1235-76	0346217522122
123	Schraube	Screw	6	M5×10	GB819-85	
124	Passfeder	Key	3	5×14	GB1096-79	0346217522124
125	Feder	Spring	5		RUN6246-101066	0346217522125
126	Unterlegscheibe	Washer	4		RUN6246-101070-1	0346217522126
127	Platte	Plate	3		RUN6246-101099	0346217522127
128	Arm	Arm	1		RUN6246-102068	0346217522128
129	Griff Drehzahlwechsel	Speed Change Handle	2		RUN6246-102065	0346217522129
130	Stahlkugel	Steel Ball	5	1/4"	GB308-77	0346217522130
131	Federstift	Spring Pin	1	5×30	GB879-76	
132	Kegelrad	Bevel Gear	1		RUN6246-102060	0346217522132
133	Distanzstück	Spacer	1		RUN6246-102062-1	0346217522133
134	Wellemhülse	Shaft Sleeve	1		RUN6246-102062	0346217522134
135	Welle	Shaft	1		RUN6141-102055	0346217522135
136	Passfeder	Key	1	5×28	GB1096-79	0346217522136
137	Wahlscheibe	Selecting Dial	1		RUN6246-102063	0346217522137
138	Platte	Plate	1		RUN6246-102082	0346217522138
139	Rad	Wheel	1		RUN6246-102053-2	0346217522139
140	Stift	Pin	1		RUN6246-106081	0346217522140
141	Stift	Pin	1		RUN6246-106081	0346217522141

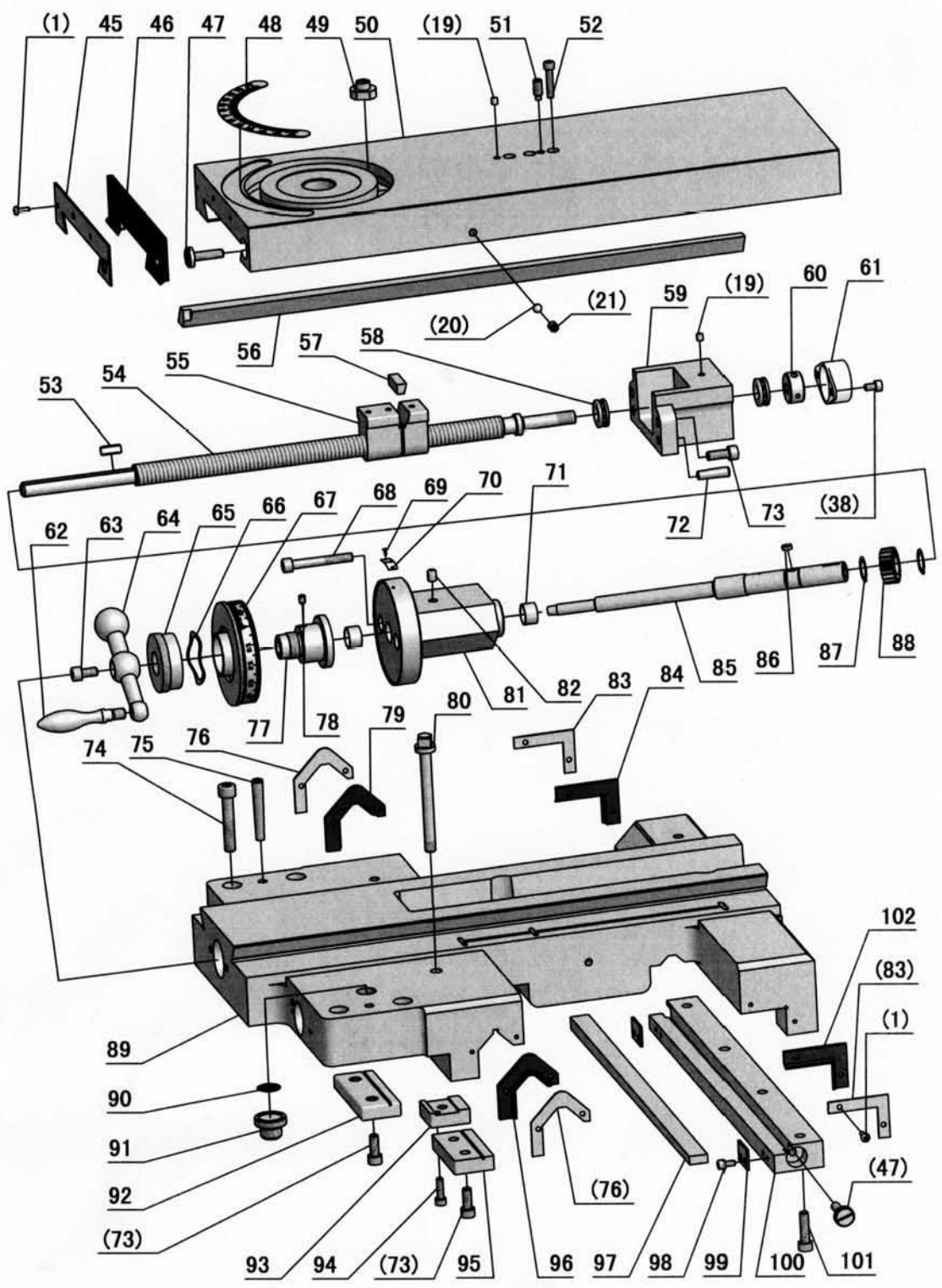
Ersatzteilliste Vorschubgetriebe - Spare part list headstock feed gear						
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size		Artikelnummer Item no.
142	Federstift	Spring Pin	1	5×35	GB879-86	0346217522142
143	Kugellager	Ball Bearing	1	180104	GB279-88	0346217522143

P Oberschlitten - Top slide



Img.8-5: Oberschlitten - Top slide

Q Planschlitten - Cross slide



Img.8-6: Planschlitten 1 von 2 - Cross slide 1 von 2

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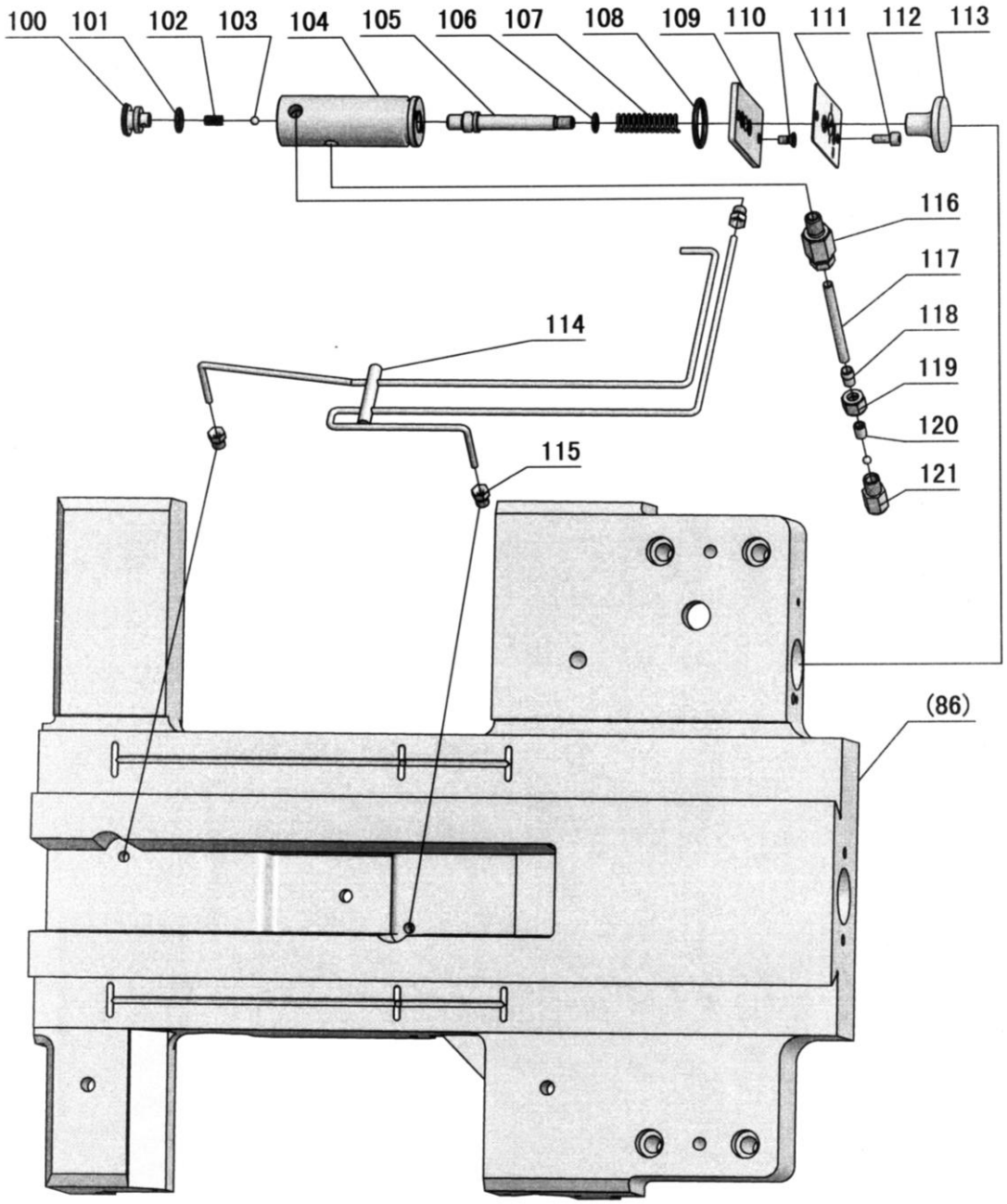
R Zentralschmierung am Planschlitten - Central lubrication on cross slide



Img.8-7: Zentralschmierung - Central lubrication

Ersatzteilliste Planschlitten, Oberschlitten, Zentralschmierung - Spare part list cross slide, top slide, central lubrication						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1		Screw	12	M4 ×12	GB818-85	
2	Abstreifergehäuse	Case-Wiper	1		RUN6141-103101	034621753302
3	Abstreifer	Wiper	1		RUN6141-103100	034621753303
4	Hülse	Sleeve	1		RUN6246-103056-1	034621753304
5	Feder	Spring	1	1×5×18	GB2089-80	034621753305
6	Einstellschraube (flache Ausführung)	Adjust Screw (Flat Type)	3		RUN6246-103058-2	034621753306
7	Runder Stift	Round Pin	1		RUN6246-103057-2	034621753307
8	Vierfach Werkzeughalter (flache Ausführung)	Four Way Tool Post (Flat Type)	1		RUN6141-103058	034621753308F

Ersatzteilliste Planschlitten, Oberschlitten, Zentralschmierung - Spare part list cross slide, top slide, central lubrication						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
8	Vierfach Werkzeughalter (Typ T)	Four Way Tool Post (T Type)	1		RUN6141-103058-3	034621753308FWT
8	T-Block (Typ T)	Block-Tee (T Type)	1		RUN6141-103058-4	03462175338BT
9	Schraube	Screw	12	M12×55	GB83-88	
10	Stift (flache Ausführung)	Pin (Flat Type)	3	D6×50	GB119-86	
11	Schraube (flache Ausführung)	Screw (Flat Type)	3	M8×10	GB77-85	
12	Klemmgriff	Clamping Handle	1		RUN6246-103062	034621753312
13	Klemmgriff	Clamping Handle	1		RUN6246-103061	034621753313
14	Unterlegscheibe	Washer	1		RUN6246-103060	034621753314
15	Drucklager	Thrust Bearing	1	8104	GB301-84	034621753315
16	Hülse (flache Ausführung)	Sleeve (Flat Type)	1		RUN6246-103058-1	034621753316
17	Welle Werkzeughalter (flache Ausführung)	Tool Post Shaft (Flat Type)	1		RUN6141-103054	034621753317
17	Welle Werkzeughalter (T-Typ)	Tool Post Shaft (T Type)	1		RUN6141-103054-1	034621753317
18	Schraube	Screw	1	M8×40	GB77-85	
19	Kugeltasse	Ball Cup	6	6	GB1155-79	034621753319
20	Stahlkugel	Steel Ball	2	1/4"	GB308-84	034621753320
21	Schraube	Screw	2	M8×10	GB80-85	
22	Oberschlitten (flache Ausführung)	Compound Rest (Flat Type)	1		RUN6141-103050	034621753322
22	Oberschlitten (T-Typ)	Compound Rest (T Type)	1		RUN6141-103050-2	034621753322
23	Mutter (Metrisch)	Nut (Metric)	1		RUN6246H-103043-1	034621753323
23	Mutter (Zoll)	Nut (Inch)	1		RUN6246H-103043-2	034621753323inch
24	Spindel Oberschlitten (Metrisch)	Screw-Compound Rest (Metric)	1		RUN6246-103043	034621753324
24	Spindel Oberschlitten (Zoll)	Screw-Compound Rest (Inch)	1		RUN6246-103043-3	034621753324inch
25	Schraube	Screw	1	M6×6	GB80-85	
26	Schraube	Screw	1	M5×8	GB80-85	
27	Federstift	Spring Pin	1	2×12	GB879-86	
28	Drucklager	Thrust Bearing	2	8102	GB301-84	034621753328
29	Sitzführung Oberschlitten Spindel	Seat Compound Rest Screw	1		RUN6246-103044	034621753329
30	Schraube	Screw	2	M6×20	GB70-85	
31	Mutter	Nut	1		RUN6246-103044-1	034621753331
32	Manschette	Collar	1		RUN6246-103045	034621753332
33	Skalenscheibe Oberschlitten (Metrisch)	Dial-Compound Rest (Metric)	1		RUN6246-103046-1	034621753333
33	Skalenscheibe Oberschlitten (Zoll)	Dial-Compound Rest (Inch)	1		RUN6246-103046-2	034621753333inch
34	Wellenform Scheibe	Wave Type Washer	1		RUN6246-103047-1	034621753334
35	Mutter	Nut	1		RUN6246-103047	034621753335
36	Griff	Handle	1		RUN6246-103048	034621753336
37	Griff	Handle	1		RUN6246-103049	034621753337
38	Schraube	Screw	3	M6×10	GB70-85	034621753338
39	Schraube	Screw	1	M10×60	GB70-85	
40	Schraube	Screw	1		RUN6246-103037	034621753340
41	Leiste	Gib	1		RUN6141-103051	034621753341
42	Schraube	Screw	2	M10×35	GB70-85	
43	Schwenkplatte	Swivel Table	1		RUN6246H-103041	034621753343
44	Schraube	Screw	2	M6×10	GB80-85	
45	Abstreifergehäuse	Case-Wiper	1		RUN6141-103039	034621753345
46	Abstreifer	Wiper	1		RUN6141-103038	034621753346
47	Schraube	Screw	4		RUN6246-103036	034621753347
48	Anzeige Skalenscheibe	Indicator Dial	1		RUN6141-103002-1	034621753348
49	Mutter	Nut	3		RUN6246-103040	034621753349
50	Abdeckung Planschlitten	Cover-Cross Sliding	1		RUN6141-103002	034621753350
51	Schraube	Screw	1	M8×20	GB79-85	
52	Schraube	Screw	3	M6×30	GB70-85	
54	Spindel Planschlitten (Zoll)	Cross Feed Screw (Inch)	1		RUN6141-103021	
54	Spindel Planschlitten (Metrisch)	Cross Feed Screw (Metric)	1		RUN6141-103021-1	034621753354
55	Mutter (Metrisch)	Nut (Metric)	1		RUN6141-103003	034621753355
55	Mutter (Zoll)	Nut (Inch)	1		RUN6141-103003-1	
56	Leiste	Gib	1		RUN6141-103035	034621753356
57	Leiste	Gib	1		RUN6246-103004	034621753357
58	Drucklager	Thrust Bearing	2	8101	GB301-84	034621753358
59	Halterung	Bracket	1		RUN6141-103007	034621753359
60	Mutter	Nut	1		RUN6246-103007-1	034621753360
61	Abdeckung	Cover	1		RUN6141-103105	034621753361
62	Griff	Handle	1		RUN6246-103030A	034621753362
63	Schraube	Screw	2	M8×16	GB70-85	
64	Griff	Handle	1		RUN6246-103029	034621753364
65	Mutter	Nut	1		RUN6246-103028	034621753365

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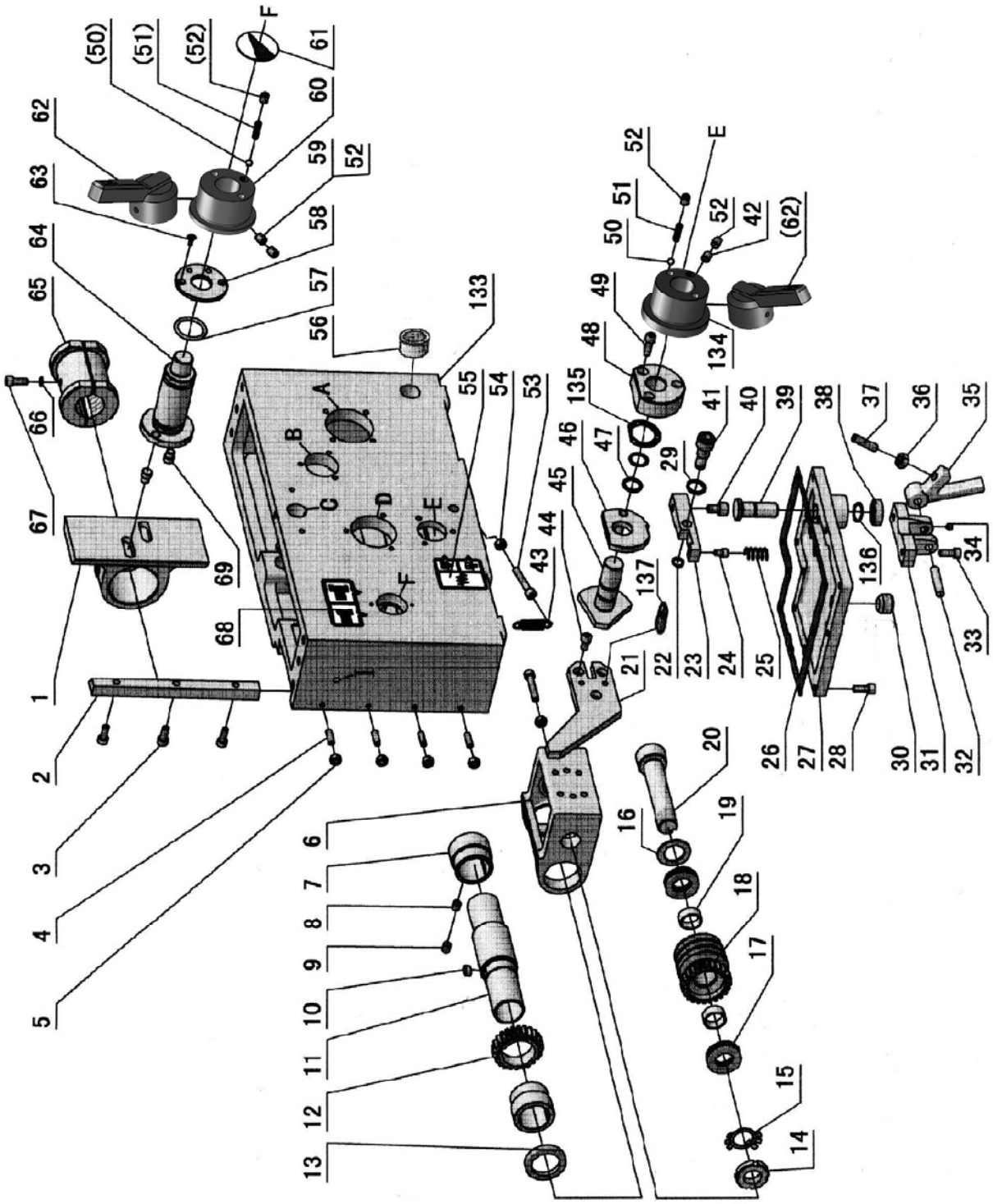
Ersatzteilliste Planschlitten, Oberschlitten, Zentralschmierung - Spare part list cross slide, top slide, central lubrication						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
66	Wellenform Scheibe	Wave Type Washer	1		RUN6246-103025	034621753366
67	Skalenscheibe Planschlitten (Metrisch)	Cross Feed Dial (Metric)	1		RUN6141-103027	034621753367
67	Skalenscheibe Planschlitten (Zoll)	Cross Feed Dial (Inch)	1		RUN6141-103027-1	
68	Schraube	Screw	2	M8×60	GB70-85	
69	Niet	Rivet	4	2×5	GB827-86	034621753369
70	Platte	Plate	2		RUN460-105031	034621753370
71	Lager	Bearing	2	1810	SF-1	034621753371
72	Kegelstift	Taper Pin	2	6×26	GB118-86	
73	Schraube	Screw	6	M8×20	GB70-85	
74	Schraube	Screw	4	M10×55	GB70-85	
75	Kegelstift	Taper Pin	2	8×60	GB118-86	
76	Abstreifergehäuse	Case-Wiper	2		RUN6141-103013	034621753376
77	Kupplung Skalenscheibe	Clutch-Dial	1		RUN6246-103026	034621753377
78	Schraube	Screw	1	M6×8	GB80-85	
79	Abstreifer	Wiper	1		RUN6141-103011	034621753379
80	Schraube	Bolt	1		RUN6246-103077	034621753380
81	Halterung	Bracket	1		RUN6246-103023	034621753381
82	Kugeltasse	Ball Cup	1	8	GB1155-79	034621753382
83	Abstreifergehäuse	Case-Wiper	2		RUN6141-103010	034621753383
84	Abstreifer	Wiper	1		RUN6141-103008	034621753384
85	verzahnte Welle Planschlitten	Cross Feed Pinion	1		RUN6246-103022	034621753385
86	Sattel	Saddle	1		RUN6141-103001	034621753386
87	Platte	Plate	1		RUN6246-103031-1	034621753387
88	Verschlussstopfen Öl Einlass	Plug-Oil Inlet	1		RUN6246-103031	034621753388
89	Leiste vorne	Gib-Front	1		RUN6141-103020	034621753389
90	Leiste vorne links	Gib-Left-Front	1		RUN6141-103018	034621753390
91	Schraube	Screw	1	M6×20	GB70-85	
92	Klemmschlitten	Clamp-Carriage	1		RUN6246-103019	034621753392
93	Abstreifer	Wiper	1		RUN6141-103012	034621753393
94	Leiste	Gib	1		RUN6141-103015	034621753394
95	Schraube	Screw	4	M5×8	GB70-85	
96	Leitblech	Baffle	2		RUN6141-103016-1	034621753396
97	Halteleiste	Holder Gib	1		RUN6141-103016	034621753397
98	Schraube	Screw	4	M8×30	GB70-85	
99	Abstreifer	Wiper	1		RUN6141-103009	034621753399
100	Olverschluss	Oil Plug	1		RUN6246-103070	0346217533100
101	O-Ring	O-Ring	1	16×2.4	GB1235-76	0346217533101
102	Feder	Spring	1	0.5×4.5×16	GB2089-80	0346217533102
103	Stahlkugel	Steel Ball	2	Ø5	GB308-84	0346217533103
104	Pumpenkörper	Body Pump	1		RUN6246-103063	0346217533104
105	Kolbenstange	Piston Rod	1		RUN6246-103064	0346217533105
106	O-Ring	O-Ring	1	9×1.8	GB3452.1-82	0346217533106
107	Feder	Spring	1		RUN6246-103065	0346217533107
108	O-Ring	O-Ring	1	32×3.1	GB1235-76	0346217533108
109	Bodenplatte	Bottom Board	1		RUN6246-103066	0346217533109
110	Schraube	Screw	2	M5×10	GB68-85	
111	Platte	Plate	1		RUN6246-103068	0346217533111
112	Schraube	Screw	2	M5×12	GB70-85	
113	Verschlusskappe	Plug	1		RUN6246-103067	0346217533113
114	Verbundstück	Vitta welding	1		RUN6141-103106	0346217533114
115	Rohrverschraubung	Tube Fitting	3	Z 1/8"×Ø4		0346217533115
116	Rohrverschraubung	Tube Fitting	1	Z 1/8"×Ø6		0346217533116
117	Messingrohr	Brass Tube	1	Ø6×170		0346217533117
118	Rohrverschraubung	Tube Fitting	1		RUN6246-103071	0346217533118
119	Mutter	Nut	1		RUN6246-103072	0346217533119
120	Hülse	Sleeve	1		RUN6246-103073-2	0346217533120
121	Einwegeventil Endstück	One Way Valve Ass	1		RUN6246-103073-1	0346217533121
122	Schraube	Screw	4	M5×14	GB818-85	
123	Welle	Shaft	1		RUN6141-103103	0346217533123
124	Unterlegscheibe	Washer	1	8	GB70.1-85	

S Schlosskasten ohne Eilgan 1 von 2 - Apron without rapid feed 1 of 2



Img.8-8: Schlosskasten 1 von 2 - Apron 1 of 2

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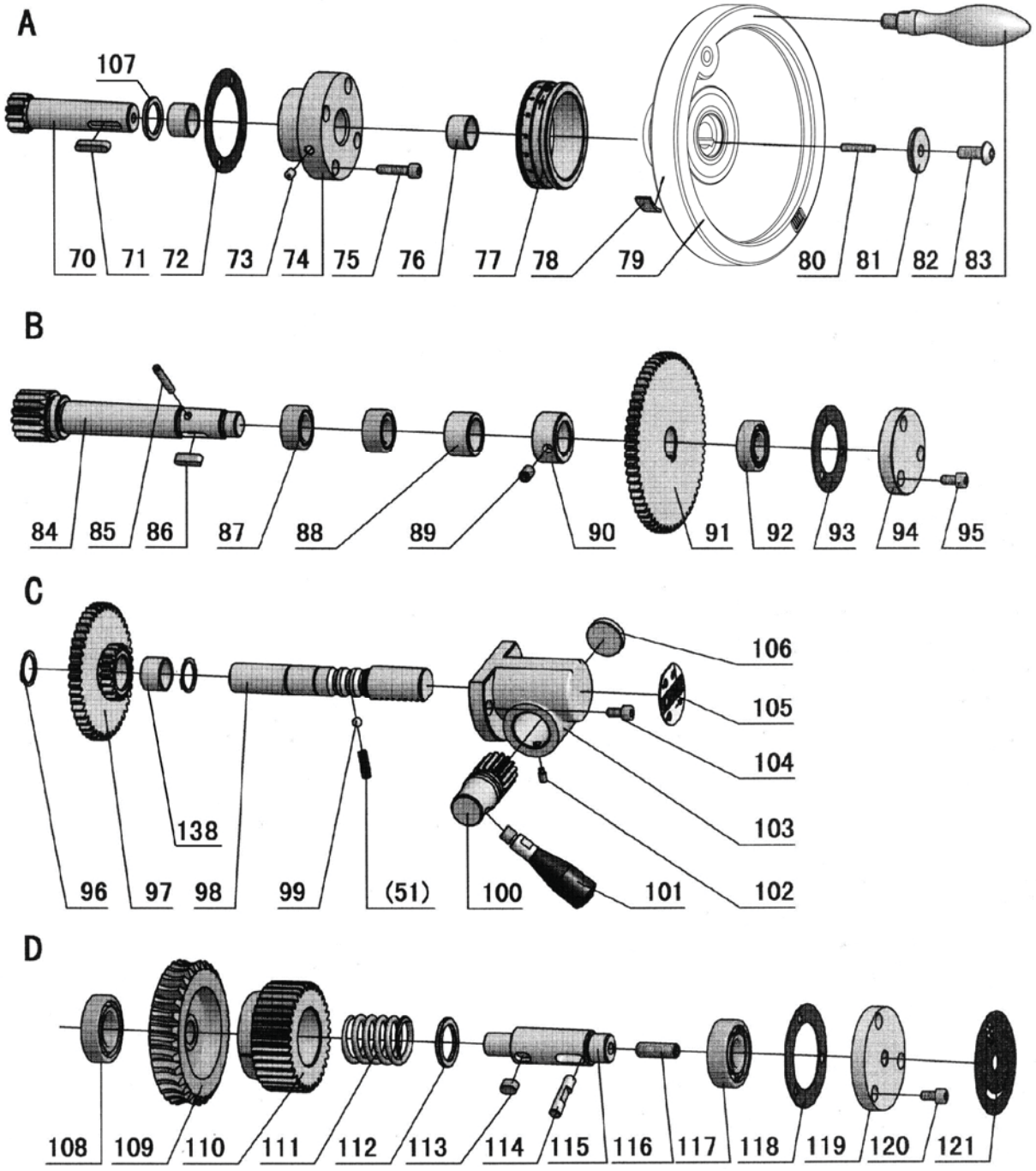
T Schlosskasten ohne Eilgang 2 von 2 - Apron without rapid feed 2 of 2



Img. 8-9: Schlosskasten 2 von 2 - Apron 2 of 2

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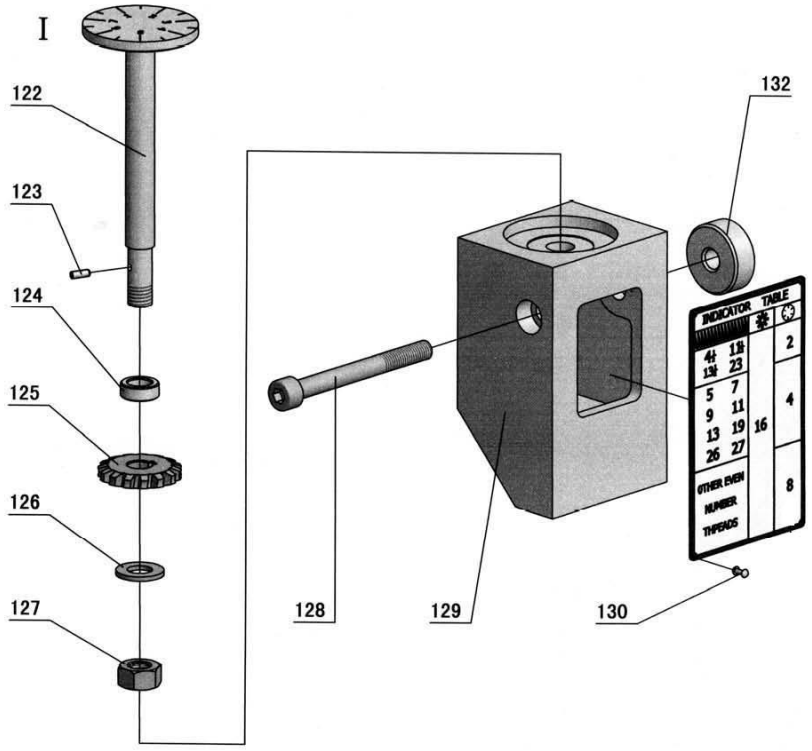
U Gewindeuhr (Option) - Thread cutting device (Option)



Img.8-10: Gewindeuhr - Thread cutting device

Schlosskasten ohne Eilgang - Apron without rapid feed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
Pos.	Bezeichnung	Designation	Menge Qty.	Grösse Size	Verweis Reference	Artikelnummer Article no.
1	Gehäuse Leitspindelmutter (Handrad rechts)	Lead Nut Assy (Right Hand)	1		RUN460-104003A	034621754401R
1	Gehäuse Leitspindelmutter (Handrad links)	Lead Nut Assy (Left Hand)	1		RUN460-104003B	034621754401
2	Leiste	Gib	1		RUN460-104002	034621754402
3	Schraube	Screw	3	M6×16	GB70-85	
4	Schraube	Screw	4	M6×20	GB80-85	
5	Mutter	Nut	4	M6	GB6170-86	
6	Schneckensitz	Seat-Worm	1		RUN460-104018-01	034621754406
7	Buchse	Bushing	2		RUN460-104015	034621754407
8	Schraube	Screw	2	M8×10	GB80-85	
9	Schraube	Screw	2	M8×10	GB77-85	
10	Passfeder	Key	1	6×12	GB1096-79	034621754410
11	Hülse Zugspindel	Sleeve-Feed Rod	1		RUN460-104016	034621754411
12	Zahnrad	Gear	1		RUN460-104017	034621754412
13	Öldichtung	Oil Seal	2	TC32×42×8		034621754413
14	Mutter	Nut	1	M20×1.5	GB812-88	034621754414
15	Mutter	Nut	1	20	GB858-88	034621754415
16	Unterlegscheibe	Washer	1		RUN6246-104020/1	034621754416
17	Drucklager	Thrust Bearing	2	8104	GB301-84	034621754417
18	Schneckenrad	Worm Gear	1		RUN460-104020	034621754418
19	Set	Set	2	2010	SF-1	034621754419
20	Welle	Shaft	1		RUN6246-104019	034621754420
21	Block Sicherungseinrichtung (Handrad rechts)	Safe Device Block (Right Hand)	1		RUN460-104023-01	034621754421R
21	Block Sicherungseinrichtung (Handrad links)	Safe Device Block (Left Hand)	1		RUN460-104023-02	034621754421
22	Sicherungsring	Snap Ring	1	10	GB894.1-86	034621754422
23	Hebel	Lever	1		RUN460-104030	034621754423
24	Schraube	Screw	1	M5×8	GB70-85	
25	Feder	Spring	1		RUN460-104032	034621754425
26	Untere Abdeckung	Bottom Cover	1		RUN460-104011	034621754426
27	Dichtscheibe	Sealed Mat	1		RUN460-104011-1	034621754427
28	Schraube	Screw	9	M6×16	GB70-85	
29	Unterlegscheibe	Washer	1	12	JB982-77	034621754429

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Schlosskasten ohne Eilgang - Apron without rapid feed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
30	Ölverschluss	Oil Plug	1	Z 3/8"	G38-3A	034621754430
31	Halterung	Bracket	1		RUN460-104012	034621754431
32	Stift	Pin	1	B8×40	GB119-86	
33	Schraube	Screw	2	M6×16	GB70-85	
34	Schraube	Screw	1	M6×6	GB80-85	
35	Hebel	Lever	1		RUN460-104014	034621754435
36	Schraube	Screw	1	M8×30	GB77-85	
37	Mutter	Nut	1	M8	GB6170-86	034621754437
38	Öldichtung	Oil Seal	1	TC15×25×7		034621754438
39	Stift	Pin	1		RUN460-104010	034621754439
40	Schraube	Screw	1	M8×12	GB70-85	
41	Schraube	Screw	1		RUN460-104031	034621754441
42	Schraube	Screw	1	M8×10	GB80-85	
43	Feder	Spring	1		RUN460-104022-02	034621754443
44	Schraube	Screw	3	M6×12	GB70-85	
45	Welle (Handrad rechts)	Shaft (Right Hand)	1		RUN460-104026-01	034621754445R
45	Welle (Handrad links)	Shaft (Left Hand)	1		RUN460-104026-02	034621754445
46	Puffer (Handrad rechts)	Buffer (Right Hand)	1		RUN460-104027-H02	034621754446R
46	Puffer (Handrad links)	Buffer (Left Hand)	1		RUN460-104027-H01	034621754446
47	O-Ring	O-Ring	2	20×2.4	GB1235-76	034621754447
48	Hülse	Sleeve	1		RUN460-104028	034621754448
49	Schraube	Screw	3	M6×20	GB70-85	
50	Stahlkugel	Steel Ball	2	1/4"	GB308-84	034621754450
51	Feder	Spring	3		RUN6246-101066	034621754451
52	Schraube	Screw	4	M8×10	GB77-85	
53	Schraube	Screw	2	M6×35	GB70-85	
54	Mutter	Nut	2	M6	GB6170-86	
55	Knopf (Handrad rechts)	Knob (Right Hand)	1		RUN6246-104074	034621754455R
55	Knopf (Handrad links	Knob (Left Hand)	1		RUN6246-104074-2	034621754455
56	Olschauglas	Oil Sight	1	20	R51-5A	034621754456
57	O-Ring	O-Ring	2	32×3.5	GB1235-76	034621754457
58	Unterlegscheibe	Washer	1		RUN460-104007/1	034621754458
59	Schraube	Screw	1	M8×10	GB80-85	
60	Wellenhülse (Handrad rechts)	Shaft Sleeve (Right Hand)	1		RUN460-104007-02	034621754460
60	Wellenhülse (Handrad links)	Shaft Sleeve (Left Hand)	1		RUN460-104007-01	034621754460R
61	Platte	Plate	1		RUN6246-101099	034621754461
62	Hebel	Lever	2		RUN460-104008-1	034621754462
63	Schraube	Screw	2	M4×10	GB819-85	
64	Welle (Handrad rechts)	Shaft (Right Hand)	1		RUN460-104006-01	034621754464R
64	Welle (Handrad links)	Shaft (Left Hand)	1		RUN460-104006-02	034621754464
65	Mutter Leitspindel (Metrisch)	Haft Nut (Metric)	1		RUN6246-104004-01	034621754465
65	Mutter Leitspindel (Zoll)	Haft Nut (Inch)	1		RUN6246-104004-02	
66	Federstift	Spring Pin	2	6	GB93-87	
67	Schraube	Screw	2	M6×20	GB70-85	
68	Platte (Handrad rechts)	Plate (Right Hand)	1		RUN460-104073	034621754468R
68	Platte (Handrad links)	Plate (Left Hand)	1		RUN460-104073-1	034621754468
69	Passfeder	Key	2		RUN460-104005	034621754469
70	Welle	Shaft	1		RUN460-104051	034621754470
71	Passfeder	Key	1	6×25	GB1096-79	034621754471
72	Dichtscheibe	Sealed Mat	1		RUN460-104052-1	034621754472
73	Kugeltasse	Ball Cup	1	6	GB1155-89	034621754473
74	Sitz	Seat	1		RUN460-104052	034621754474
75	Schraube	Screw	4	M6×25	GB70-85	
76	Lager	Bearing	2	2010	SF-1	034621754476
77	Skalenscheibe Zahnstange (Metrisch)	Dial-Rack (Metric)	1		RUN460-104054-01	034621754477
77	Skalenscheibe Zahnstange (Zoll)	Dial-Rack (Inch)	1		RUN460-104054-02	
78	Feder	Spring	1	80	Q67-4-33	034621754478
79	Handrad	Hand Wheel	1		RUN460-104055	034621754479
80	Schraube	Screw	1	M4×20	GB80-85	
81	Unterlegscheibe	Washer	1		RUN460-104057	034621754481
82	Schraube	Screw	1		RUN6246-101088	034621754482
83	Griff	Handle	1		RUN460-104056A	034621754483
84	verzahnte Welle	Pinion	1		RUN460-104047	034621754484
85	Stift	Pin	1	5×35	GB879-86	
86	Passfeder	Key	1	6×20	GB1096-79	034621754486
87	Nadellager	Needle Bearing	2	4644903	GB5801-86	034621754487
88	Hülse	Sleeve	1		RUN460-104053	034621754488
89	Schraube	Screw	1	M8×12	GB80-85	
90	Distanzstück	Spacer	1		RUN460-104048	034621754490

Schlosskasten ohne Eilgang - Apron without rapid feed						
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size		Artikelnummer Item no.
91	Zahnrad	Gear	1		RUN460-104049	034621754491
92	Kugellager	Ball Bearing	1	80103	GB278-89	
93	Dichtscheibe	Sealed Mat	1		RUN460-104050-1	034621754493
94	Abdeckung	Cover	1		RUN460-104050	034621754494
95	Schraube	Screw	3	M6×12	GB70-85	
96	Sicherungsring	Snap Ring	2	20	GB894.1-86	
97	Zahnrad	Gear	1		RUN460-104041	034621754497
98	Welle	Shaft	1		RUN460-104042	034621754498
99	Stahlkugel	Steel Ball	1	7/32"	GB308-84	034621754499
100	Wechselrad	Change Gear	1		RUN460-104044	0346217544100
101	Hebelgriff	Handle Lever	1		RUN460-104045-1	0346217544101
102	Schraube	Screw	1	M5×10	GB79-85	
103	Wechselhülse	Change Sleeve	1		RUN460-104043	0346217544103
104	Schraube	Screw	2	M6×12	GB70-85	
105	Platte	Plate	1		RUN460-104077	0346217544105
106	Verschlusskappe	Plug	1		RUN460-104043/1	0346217544106
107	Unterlegscheibe	Washer	1		RUN6246-104081	0346217544107
108	Kugellager	Ball Bearing	1	180105	GB279-88	0346217544108
109	Schneckenrad	Worm Gear	1		RUN460-104034	0346217544109
110	Zahnrad	Gear	1		RUN460-104035	0346217544110
111	Feder	Spring	1		RUN460-104038	0346217544111
112	Distanzstück	Spacer	1		RUN460-104039	0346217544112
113	Passfeder	Key	1	8×12	GB1096-79	0346217544113
114	Stift	Pin	1		RUN460-104037	0346217544114
115	Abdeckung	Cover	1		RUN460-104036	0346217544115
116	Schraube	Screw	1	M10×30	GB77-85	
117	Kugellager	Ball Bearing	1	80204	GB278-89	0346217544117
118	Dichtscheibe	Sealed Mat	1		RUN460-104040-1	0346217544118
119	Abdeckung	Cover	1		RUN460-104040	0346217544119
120	Schraube	Screw	3	M6×12	GB70-85	
121	Platte	Plate	1		RUN6246-104072	0346217544121
122	Meßuhr Welle (Metrisch)	Dial Indicator Shaft (Metric)	1		RUN460-104059B	0346217544122
122	Meßuhr Welle (Zoll)	Dial Indicator Shaft (Inch)	1		RUN460-104059A	
123	Stift	Pin	1	3×8	GB879-86	
124	Distanzstück	Spacer	1		RUN460-104046	0346217544124
125	Zahnrad (Metrisch)	Gear (Metric)	1		RUN460-104060	0346217544125
125	Zahnrad (Metrisch)	Gear (Metric)	1		RUN460-104061	0346217544125
125	Zahnrad (Metrisch)	Gear (Metric)	1		RUN460-104062	0346217544125
125	Zahnrad (Zoll)	Gear (Inch)	1		RUN460-104063	
125	Zahnrad (Metrisch)	Gear (Metric)	1		RUN460-104066	0346217544125
125	Zahnrad (Metrisch)	Gear (Metric)	1		RUN460-104067	0346217544125
126	Unterlegscheibe	Washer	1	10	GB97.2-85	
127	Mutter	Nut	1	M10	GB6170-86	
128	Schraube	Screw	1	M8×85	GB70-85	
129	Gehäuse Gewindeschneiduhr	Thread Dial Body	1		RUN460-104058	0346217544129
130	Niet	Rivet	15	2×5	GB827-86	0346217544130
131	Anzeiger (Metrisch)	Indicator Dial (Metric)	1		RUN6246-104071	0346217544131
131	Anzeiger (Zoll)	Indicator Dial (Inch)	1		RUN6246-104071-1	
132	Distanzstück	Spacer	1		RUN460-104024	0346217544132
133	Bettschlitten Schürze (Handrad rechts)	Apron (Right Hand)	1		RUN6246-104001A	0346217544133R
133	Bettschlitten Schürze (Handrad links)	Apron (Left Hand)	1		RUN460-104001B	0346217544133
134	Nabe (Handrad rechts)	Hub (Right Hand)	1		RUN460-104029-01	0346217544134R
134	Nabe (Handrad links)	Hub (Left Hand)	1		RUN460-104029-02	0346217544134
135	Dichtscheibe	Sealed Mat	1		RUN460-104028-1	0346217544135
136	O-Ring	O-Ring	1	11.8×1.8	GB3452.1-82	0346217544136
137	Stift	Pin	2	5×16	GB879-86	
138	Lager	Bearing	1	2020	SF-1	0346217544138
139	Federstift	Spring Pin	1	10	GB93-87	

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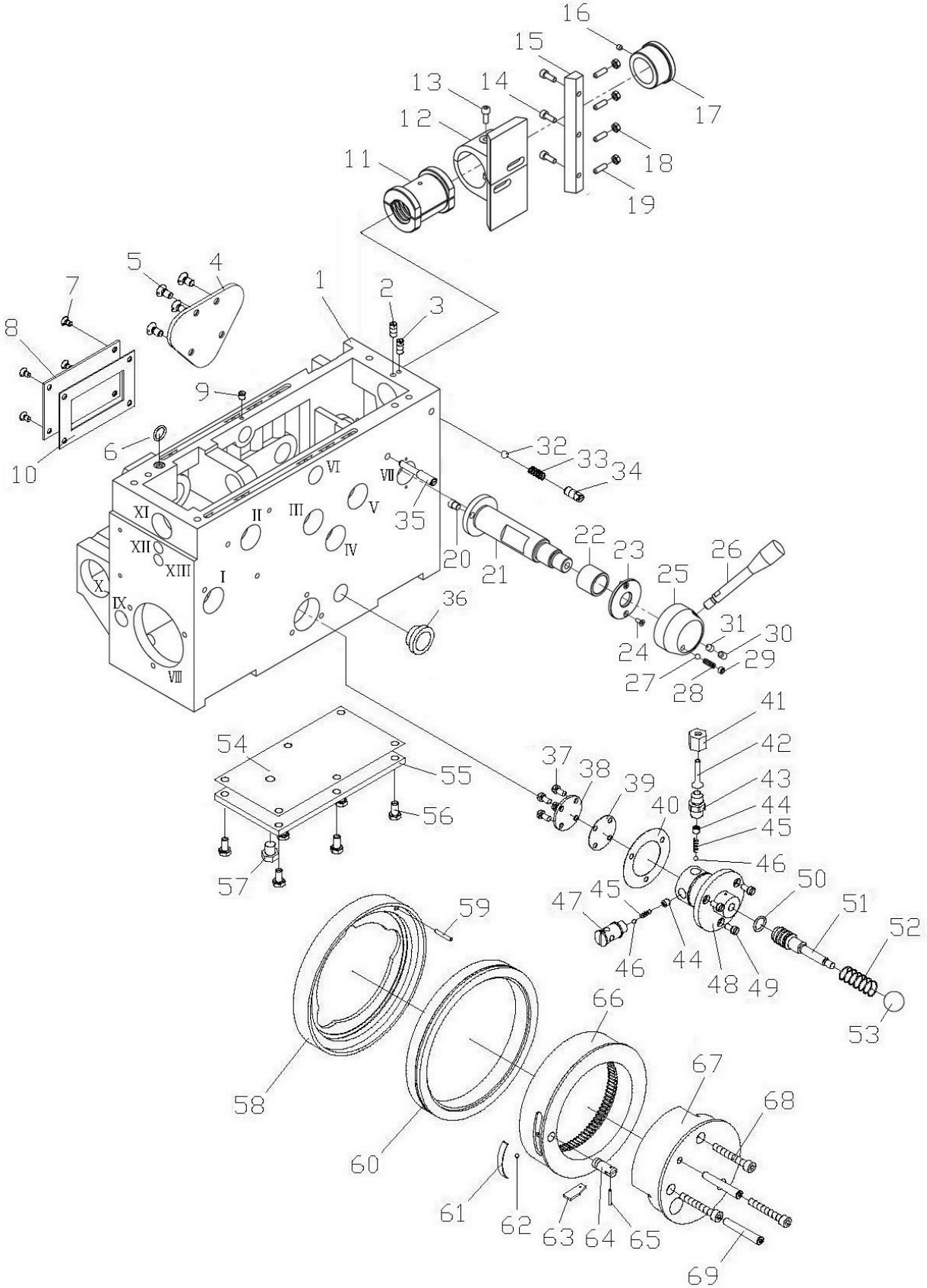
AK Schlosskasten mit Eilgang 1 von 3 - Apron with rapid feed 1 of 3



Img.8-11: Bettschlitten 1 von 3 - Apron 1 of 3

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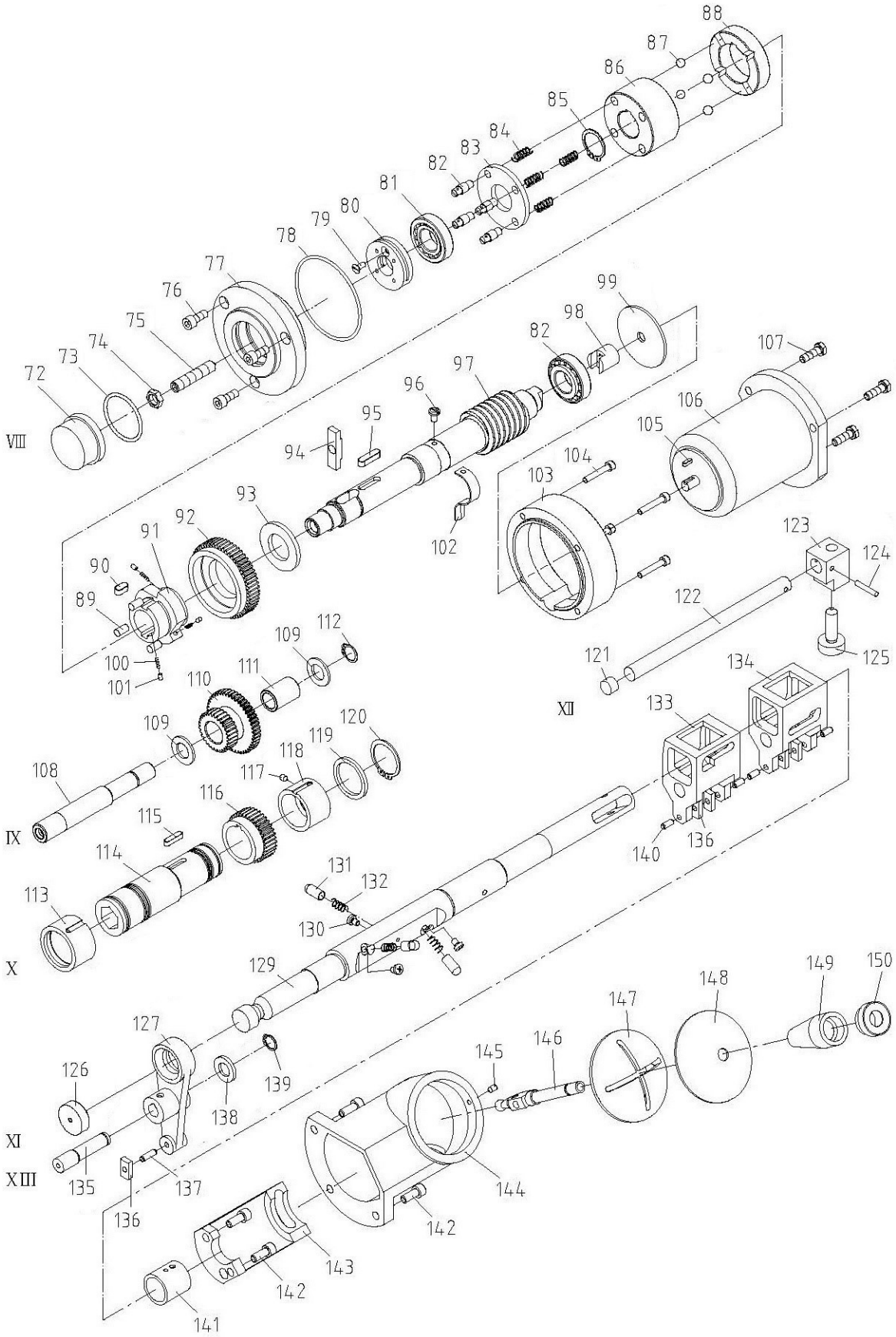
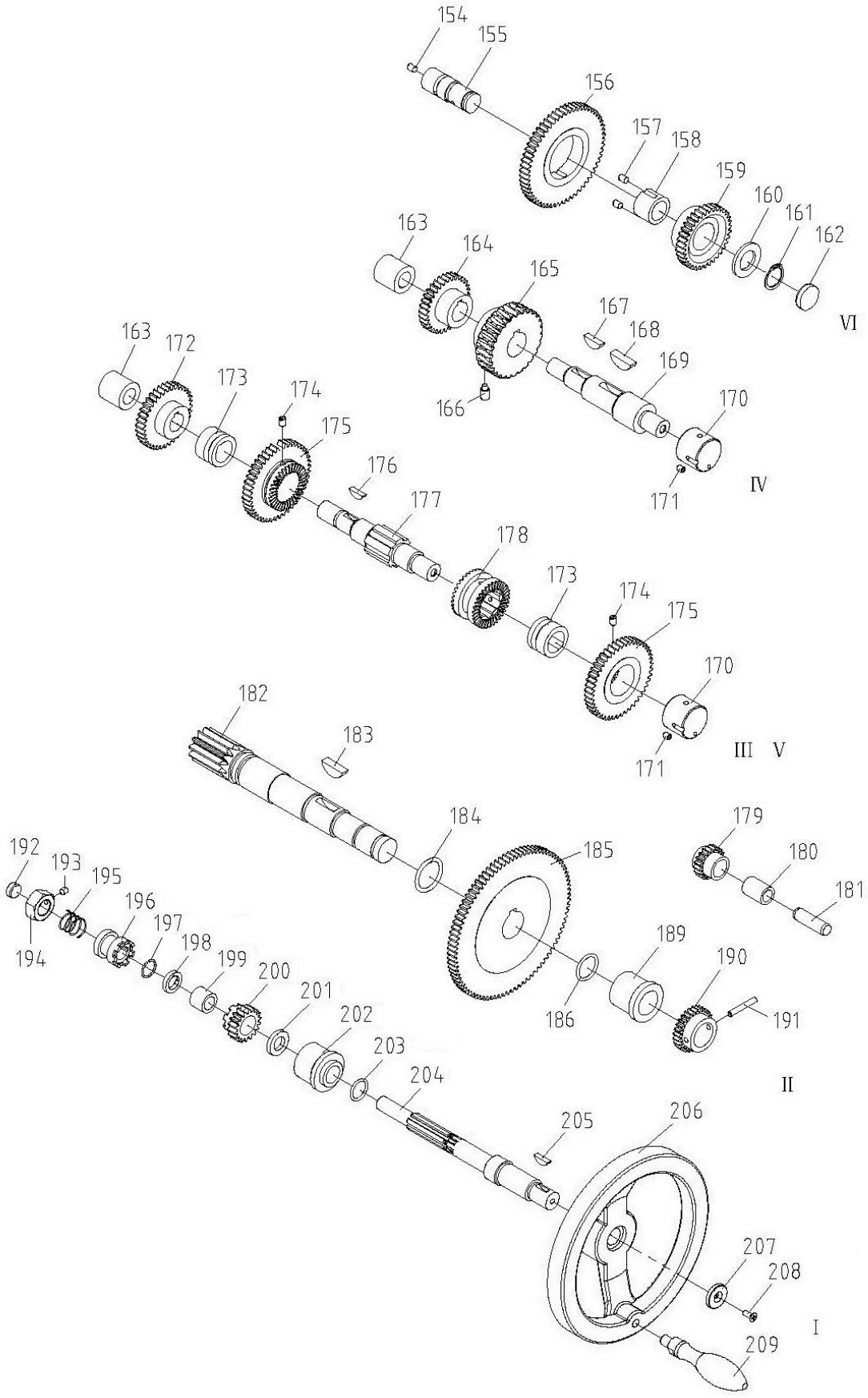
AL Schlosskasten mit Eilgang 2 von 3 - Apron with rapid feed 2 of 3



Img.8-12: Schlosskasten 2 von 3 - Apron 2 of 3

AM Schlosskasten mit Eilgang 3 von 3 - Apron with rapid feed 3 of 3



Img.8-13: Schlosskasten 3 von 3 - Apron 3 of 3

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Schlosskasten mit Eilgang - Apron with rapid feed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1	Bettschlitten Schürze	Apron	1		C6241D-06A-001A	034621600501
2	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M8x10	GB71	
3	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M8x10	GB71	
4	Abdeckung	Cover	1		CS6140-06121B	034621600504
5	Senkkopfschraube mit Schlitz	Slotted countersunk head screw	4	M8x16	GB68	
6	O-Ring	O-ring	1	14x1.9	GB1235	034621600506
7	Senkkopfschraube mit Schlitz	Slotted countersunk head screw	4	M6x10	GB68	
8	Abdeckung	Cover	1		CS6140-06122	034621600508
9	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M6x10	GB71	
10	Papierunterlage	Paper pad	1		CS6140-06133	034621600510
11	Schlossmutter (metrisch)	Half open nut (Metric)	1		RUN6246-104004-01	034621600511
12	Mutter Sitz	Nut seat	1		RUN460-104003B	034621600512
13	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	2	M6x16	GB70	
14	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	3	M6x16	GB70	
15	Leiste	Gib	1		RUN460-104002	034621600515
16	Schraube	Screw	1	M6x6	GB80	
17	Hülse	Sleeve	1		C6241D-06A-082	034621600517
18	Mutter	Nut	4	M6	GB6170	
19	Schraube	Screw	4	M6x20	GB80	
20	Passfeder	Key	2		RUN460-104005	034621600520
21	Welle	Shaft	1		C6241D-06056(YZ)	034621600521
22	Wellemhülse	Shaft sleeve	1	32x26	Q41-1	034621600522
23	Unterlegscheibe	Washer	1		RUN460-104007/1	034621600523
24	Kreuzschlitz-Senkkopfschraube	Cross recessed countersunk head screw	2	M4x10	GB819	
25	Wellenhülse	Shaft sleeve	1		RUN6246-104007-02	034621600525
26	Hebel	Lever	1		RUN460-104008-1	034621600526
27	Stahlkugel	Steel ball	1	1/4”	GB308	034621600527
28	Feder	Spring	1		RUN6246-101066	034621600528
29	Gewindestift mit Innensechskant und flachem Kopf	Hexagon socket flat head set screw	1	M8x8	GB77	
30	Gewindestift mit Innensechskant und flachem Kopf	Hexagon socket flat head set screw	1	M8x10	GB77	
31	Schraube	Screw	1	M8x10	GB78	
32	Stahlkugel	Steel ball	1	8	GB308	034621600532
33	Feder	Spring	1	1.6x8x22	Q81-1	034621600533
34	Schraube	Screw	1	M10x25	GB73	
35	Steckverbinder	Connector	1		CS6140-06095	034621600535
36	Olschauglas	Oil sight glass	1	A20(M27x1.5)	GB1160.2	034621600536
37	Schlitzschraube mit Zylinderkopf	Slotted Cheese Head Screw	4	M6x12	GB65	
38	Abdeckung	Cover	1		CS6240-06154A	034621600538
39	Papierunterlage	Paper pad	1		CS6240-06155A	034621600539
40	Papierunterlage	Paper pad	1		CS6240-06158A	034621600540
41	Stopfbuchse	Gland	1		CS6240-06162A	034621600541
42	Kupferrohr	Copper tube	1		CS6140-06168	034621600542
43	Schlauchanschluss	Hose connector	1		CS6240-06160A	034621600543
44	Einstellschraube	Adjustment screw	2		CS6240-06161A	034621600544
45	Feder	Spring	2		CS6240-06165A	034621600545
46	Stahlkugel	Steel ball	2	5	GB308	034621600546
47	Olfilter	Oil filter	1		CS6240-06157A	034621600547
48	Olpumpengehäuse	Oil pump body	1		CS6140-06152	034621600548
49	Schlitzschraube mit Zylinderkopf	Slotted Cheese Head Screw	3	M8x12	GB65	
50	O-Ring	O-ring	1	20x2.4	GB1235	034621600550
51	Stößel	Plunger	1		CS6140-06156	034621600551
52	Feder	Spring	1		CS6140-06164	034621600552
53	Kugelgriff	Handle ball	1	BM8x25	HY8311.1	034621600553
54	Papierunterlage	Paper pad	1		CS6140-06008	034621600554
55	Untere Abdeckung	Bottom cover	1		CS6140-06131	034621600555
56	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	6	M8x12	GB70	
57	Schraube	Screw	1	M12x1.5	G38-2	
58	Abdeckung	Coverage	1		CS6140-06006(YZ)	034621600558

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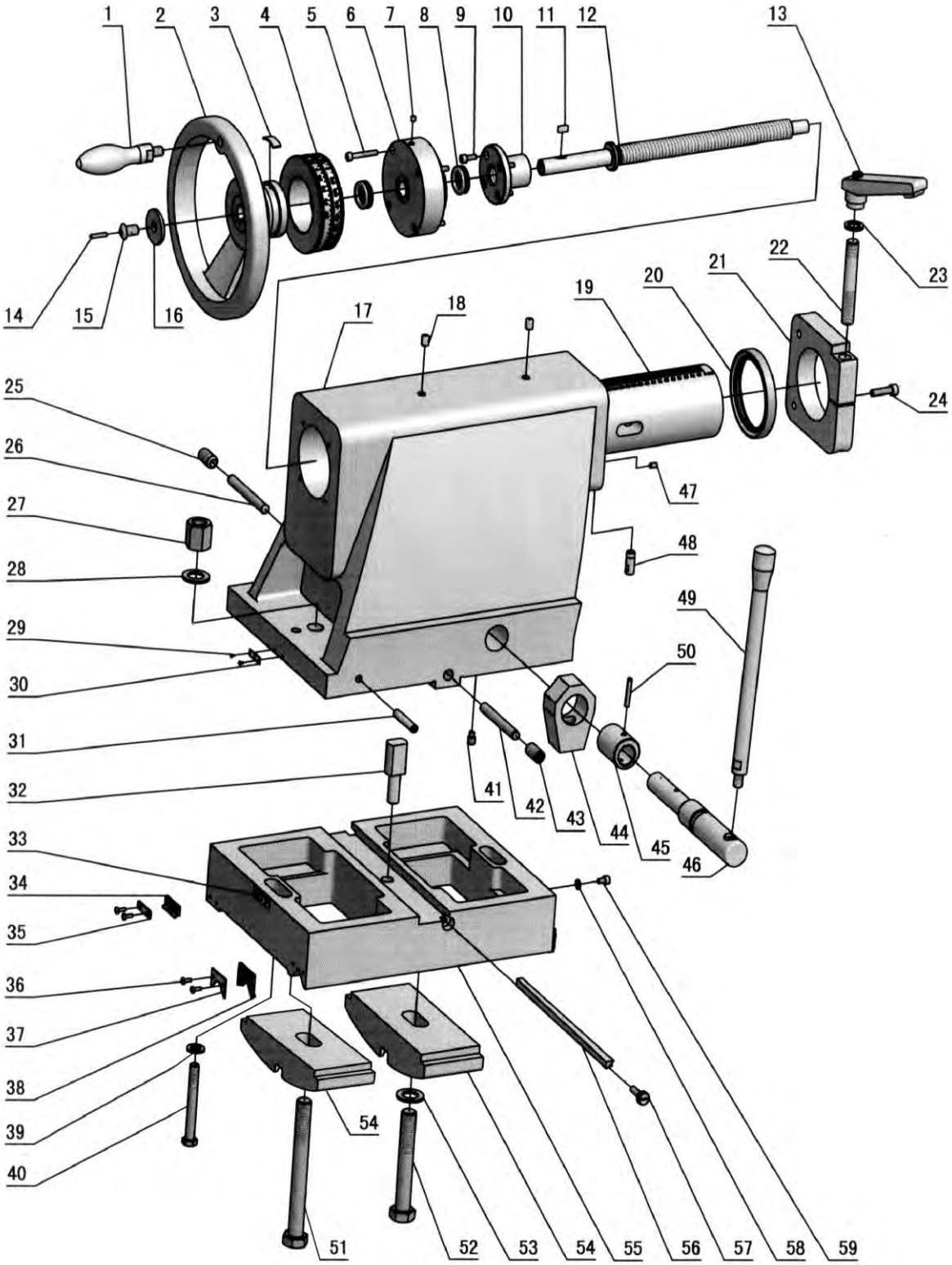
Schlosskasten mit Eilgang - Apron with rapid feed						
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size		Artikelnummer Item no.
59	Stift	Pin	1	A6x25	GB119	034621600559
60	Skalenring (Metrisch)	Scale ring (Metric)	1		CS6140-06088	034621600560
60	Skalenring (Zoll)	Scale ring (Inch)	1		CS6140-06088Y	034621600560
61	Feder	Spring	1	80-125	Q67-4-32	034621600561
62	Stahlkugel	Steel ball	1	6	GB308	034621600562
63	Griff	Handle	1		CS6140-040016	034621600563
64	Welle	Shaft	1		CS6140-06316	034621600564
65	Stift	Pin	1	3x12	GB119	034621600565
66	Innenzahnkranz	Internal gear ring	1		CS6140-06074	034621600566
67	Halterung	Support	1		CS6140-06002(YZ)	034621600567
68	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	3	M8x55	GB70	
69	Stift	Pin	2	A8x60	GB118	034621600569
72	Dichtungskappe	Sealing cap	1		CS6140-06125	034621600572
73	O-Ring	O-ring	1	56x3.5	GB1235	034621600573
74	Mutter	Nut	1	M12	GB6172	034621600574
75	Schraube	Screw	1	M12x60	GB78	
76	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	3	M8x20	GB70	
77	Haarplatte	Hair plate	1		CS6140-06007	034621600577
78	O-Ring	O-ring	1	95x3.1	GB1235	034621600578
79	Senkkopfschraube mit Schlitz	Slotted countersunk head screw	1	M6x12	GB68	
80	Runde Mutter	Round nut	1		CS6140-06097	034621600580
81	Lager	Bearing	2	7025E	GB297	0407025
82	Schraube	Bolt	4		CS6140-06096	034621600582
83	Anpassungsunterlagen	Adjustment mats	1		CS6140-06086	034621600583
84	Feder	Spring	4		CS6140-06212	034621600584
85	Sicherungsring für Welle	Circlip for shaft	1	18	GB894.1	034621600585
86	Bindemittel	Binder	1		CS6140-06085	034621600586
87	Stahlkugel	Steel ball	4	9.5	GB308	034621600587
88	Bindemittel	Binder	1		CS6140-06084	034621600588
89	Stift	Pin	3	8x14	C31-1-34	034621600589
90	Passfeder	Key	1	A8x16	GB1096	034621600590
91	Kupplungskörper	Clutch body	1		CS6140-06083	034621600591
92	Zahnrad	Gear	1		CS6140-06063	034621600592
93	Pad	Pad	1		CS6140-06108(YZ)	034621600593
94	Brikettieren	Briquetting	1		CS6140-06087	034621600594
95	Passfeder	Key	1	8x30	GB1096	034621600595
96	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	1	M6x10	GB70.1	
97	VIII Welle	VIII Shaft	1		CS6140-06057(YZ)	034621600597
98	Steckdose	Socket	1		CS6140-06107	034621600598
99	Schwingungsdämpfende Platte	Anti-vibration plate	1		CS6140-06141	034621600599
100	Feder	Spring	3	0.3x3x12	Q81-1	0346216005100
101	Stift	Pin	3	4x6	C31-1-35	0346216005101
102	Schleuderring	Slinger ring	1		CS6140-06123	0346216005102
103	Motoranschlusstafel	Motor connection board	1		C6241D-06A-008(YZ)	0346216005103
104	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	4	M6x35	GB70.1	
105	Passfeder	Key	1	A4x12	GB1096	0346216005105
106	Motor	Motor	1	YSS2-5644		0346216005106
107	Zylinderkopfschraube mit Innensechskant	Hexagon socket head cap screw	3	M8x25	GB70.1	
108	IX Welle	IX Shaft	1		CS6140-06058(YZ)	0346216005108
109	Pad	Pad	2		CS6140-06109	0346216005109
110	Zahnrad	Gear	1		C6241D-06062(YZ)	0346216005110
111	Wellenhülse	Shaft sleeve	1	25x35	Q41-1	0346216005111
112	Sicherungsring für Welle	Circlip for shaft	1	18	GB894.1	0346216005112
113	Hülse	Sleeve	1		CS6140-06024	0346216005113
114	Lichtabdeckung	Light bar cover	1		CS6140-06082	0346216005114
115	Passfeder	Key	1	6x25	GB1096	0346216005115
116	Zahnrad	Gear	1		CS6140-06061	0346216005116
117	Schraube	Screw	1	M6x8	GB78	
118	Hülse	Sleeve	1		CS6140-06023	0346216005118
119	Distanzstück	Spacer	1	38x47	Q43-1	0346216005119
120	Sicherungsring für Welle	Circlip for shaft	1	38	GB894.1	0346216005120
121	Verschlusskappe	Plug	1	16	Q56-1	0346216005121
122	Welle	Shaft	1		CS6140-06091	0346216005122
123	Block mit Verriegelung	Interlocking block	1		C6241D-06009(YZ)	0346216005123
124	Kegelstift	Taper pin	1	5x30	GB117	0346216005124
125	Verriegelungsstift	Interlock pin	1		C6241D-06092(YZ)	0346216005125

Schlosskasten mit Eilgang - Apron with rapid feed						
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size		Artikelnummer Item no.
126	Verschlusskappe	Plug	1		C6241D-06A-070(YZ)	0346216005126
127	Gabel	Fork	1		CS6140-06013	0346216005127
129	Steuerwelle	Control shaft	1		C6241D-06081(YZ)	0346216005129
130	Schraube	Screw	3	M6x8	GB67	
131	Stift	Pin	3		CS6140-06106	0346216005131
132	Schraube	Screw	3	1.6x8x22	Q81-1	0346216005132
133	Linke Gabel	Left fork	1		CS6140-06041	0346216005133
134	Rechte Gabel	Right fork	1		CS6140-06042	0346216005134
135	kleine Welle	Small shaft	1		CS6140-06113(YZ)	0346216005135
136	Schieberegler	Slider	3	12	Q99-1	0346216005136
137	Stift	Pin	1	D6x25	GB119	0346216005137
138	Pad	Pad	1		CS6140-06408	0346216005138
139	Sicherungsring für Welle	Circlip for shaft	1	14	GB894.1	0346216005139
140	Stift	Pin	4	D6x14	GB119	0346216005140
141	Wellenhülse	Shaft sleeve	1	B35x35	Q41-1	0346216005141
142	Schraube	Screw	4	M8x25	GB70.1	
143	Stützblock	Support block	1		CS6140-06043	0346216005143
144	Sitz des Vorschubgriffs	Feed handle seat	1		CS6140-06003	0346216005144
145	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M6x10	GB71	
146	Griffstange	Handle bar	1		CS6140-06103A	0346216005146
147	Abdeckung	Cross cover	1		CS6140-06012	0346216005147
148	Staubschutzabdeckung	Dust cover	1		CS6140-06151	0346216005148
149	Griff	Handle	1		CS6140-06104A	0346216005149
150	Abdeckung des Griffs	Handle cover	1		CS6140-06105A	0346216005150
154	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M6x10	GB71	
155	VI Welle	VI Shaft	1		CS6140-06054A	0346216005155
156	Zahnrad	Gear	1		CS6140-06068	0346216005156
157	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	2	M6x8	GB71	
158	Wellenhülse	Shaft sleeve	1	28x20	Q41-1	0346216005158
159	Zahnrad	Gear	1		CS6140-06067	0346216005159
160	Pad	Pad	1		CS6140-06090	0346216005160
161	Sicherungsring für Welle	Circlip for shaft	1	20	GB894.1	0346216005161
162	Verschlusskappe	Plug	1	32	Q56-1	0346216005162
163	Hülse	Sleeve	3		CS6140-06033	0346216005163
164	Zahnrad	Gear	1		CS6140-06064	0346216005164
165	Schneckenrad	Worm gear	1		CS6140-06021	0346216005165
166	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	1	M8x16	GB72	
167	Passfeder	Key	1	6x22	GB1099	0346216005167
168	Passfeder	Key	1	8x28	GB1099	0346216005168
169	V Welle	V Shaft	1		CS6140-06055	0346216005169
170	Endkappe	End cap	3		C6241D-06032(YZ)	0346216005170
171	Schraube	Screw	3	M6x8	GB78	
172	Zahnrad	Gear	2		CS6140-06065	0346216005172
173	Hülse	Sleeve	4		CS6140-06025	0346216005173
174	Gewindestift mit Schlitz und Kegelspitze	Slotted set screw with cone point	4	M5x10	GB71	
175	Zahnrad	Gear	4		CS6140-06066	0346216005175
176	Passfeder	Key	2	5x19	GB1099	0346216005176
177	III , IV Welle	III , IV Shaft	2		CS6140-06053	0346216005177
178	Bindemittel	Binder	2		CS6140-06089	0346216005178
179	Zahnrad	Gear	1		CS6140-06073	0346216005179
180	Wellenhülse	Shaft sleeve	1	18x25	Q41-1	0346216005180
181	Stift	Pin	1	B12x40	GB119	0346216005181
182	Zahnradwelle	Gear shaft	1		C6241D-06052(YZ)	0346216005182
183	Passfeder	Key	1	8x28	GB1099	0346216005183
184	O-Ring	O-ring	1	32x3.5	GB1235	0346216005184
185	Zahnrad	Gear	1		CS6140-06069(YZ)	0346216005185
186	O-Ring	O-ring	1	25x2.4	GB3452.1	0346216005186
189	Hülse	Sleeve	1		CS6140-06031	0346216005189
190	Zahnrad	Gear	1		CS6140-06072	0346216005190
191	Kegelstift	Taper pin	1	A5x35	GB117	0346216005191
192	Block	Blocking	1		CS6140-06126	0346216005192
193	Schraube	Screw	1	M6x8	GB78	0346216005193
194	Mutter	Nut	1	M18x1.5	CS6140-06407	0346216005194
195	Feder	Spring	1		CS6140-06406	0346216005195
196	Bindemittel	Binder	1		CS6140-06112A	0346216005196
197	Drahtsicherungsring für Welle	Wire retaining ring for shaft	1	18	GB/T895.2	0346216005197
198	Pad	Pad	1		CS6140-06114A	0346216005198

Schlosskasten mit Eilgang - Apron with rapid feed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
199	Hülse	Sleeve	1		CS6140-06317	0346216005199
200	Zahnrad	Gear	1		CS6140-06071A	0346216005200
201	Pad	Pad	1		CS6140-06115A	0346216005201
202	Hülse	Sleeve	1		CS6140-06011	0346216005202
203	O-Ring	O-ring	1	18x2.4	GB1235	0346216005203
204	I Welle	I Shaft	1		CS6140-06051A	0346216005204
205	Passfeder	Key	1	5x19	GB1099	0346216005205
206	Handrad	Handwheel	1		C6241D-06A-077	0346216005206
207	Sicherungsring	Retaining ring	1	B25	GB891	0346216005207
208	Kreuzschlitz-Senkkopfschraube	Cross recessed countersunk head screw	1	M5x12	GB819	
209	Drehgriff	Turning handle	1		RUN460-104056A	0346216005209

V Reitstock - Tailstock



Img.8-14: Reitstock - Teilstock

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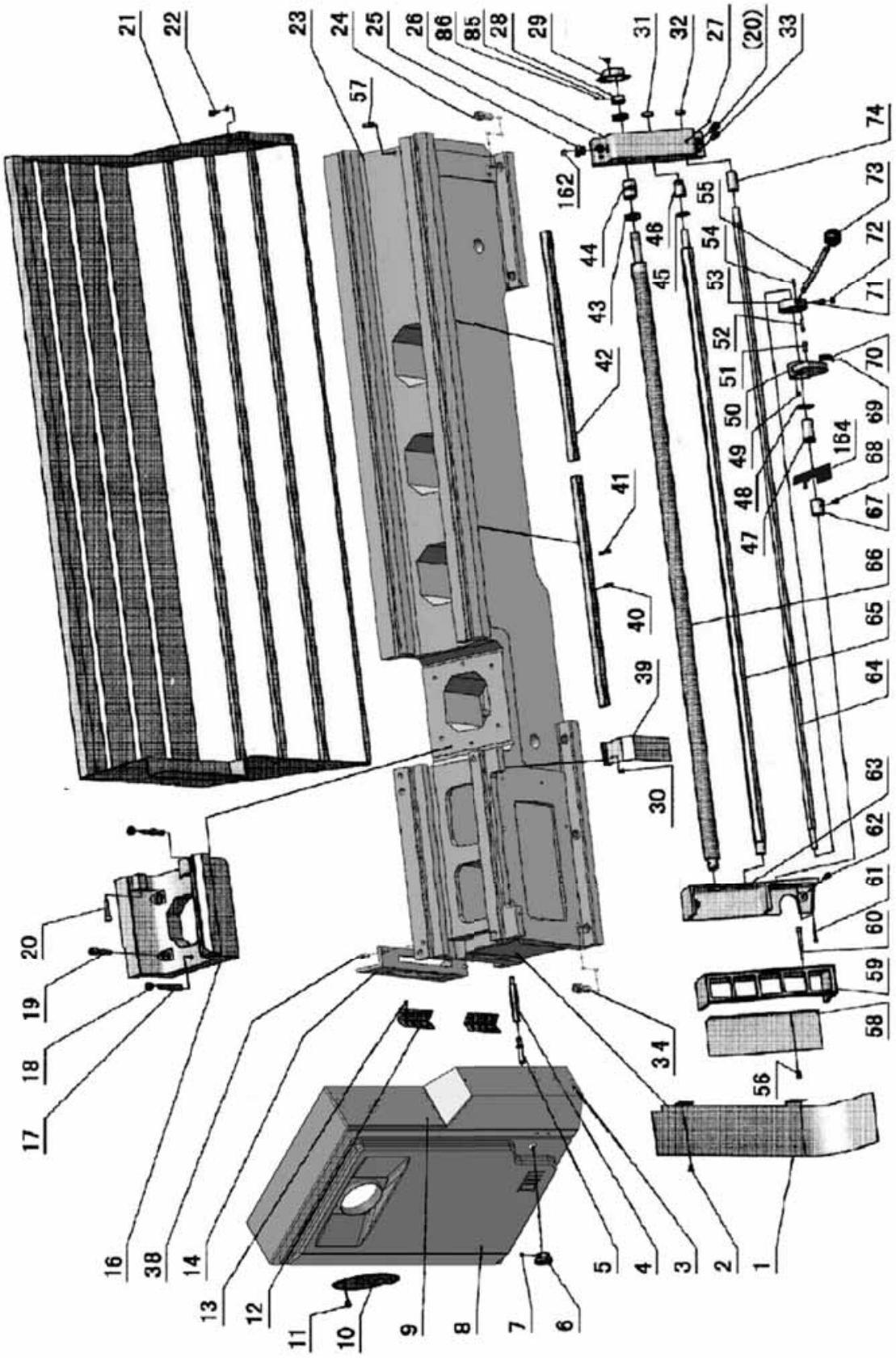
Ersatzteilliste Reitstock- Spare parts list tailstock						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1	Griff	Handle	1		RUN460-104056A	034621755501
2	Handrad	Handwheel	1		C6246B-105010	034621755502
3	Feder	Spring	1	100	Q67-4-33	034621755503
4	Teilring (Metrisch)	Graduation Ring (Metric)	1		C6251A-08A-03	034621755504
4	Teilring (Zoll)	Graduation Ring (Inch)	1		C6251A-08A-03Y	
5	Schraube	Screw	4	M6×40	GB/T70.1	
6	Flansch	Flange	1		C6251A-08-02	034621755506
7	Oler	Oil Cup	1	6	GB/T1155	034621755507
8	Axial-Kugellager	Thrust Ball Bearing	2	20×35×10	GB/T301	034621755508
9	Schraube	Screw	4	M6×16	GB/T70	
10	Schraubverschluss (Metrisch)	Screw Cap (Metric)	1		C6246B-105005	034621755510
10	Schraubverschluss (Zoll)	Screw Cap (Inch)	1		C6246B-105005-01	
11	Passfeder	Key	1	6×15	GB/T1096	034621755511
12	Vorschubspindel (Metrisch)	Feeding Lead Screw (Metric)	1		C6251A-08-01	034621755512
12	Vorschubspindel (Zoll)	Feeding Lead Screw (Inch)	1		C6251A-08-01Y	
13	Einstellbarer fester Griff	Adjustable Fixed Handle	1	A-M16×110	Z52-2	034621755513
14	Schraube	Screw	1	M5×25	GB/T80	
15	Schraube	Screw	1		C6266-08-18	034621755515
16	Unterlegscheibe	Washer	1		C6266-08-19	034621755516
17	Reitstock	Tailstock	1		C6251A-08B-01	034621755517
18	Oler	Oil Cup	2	10	GB/T1155	034621755518
19	Pinole	Quill	1		C6251A-08B-02	034621755519
20	Öldichtung	Oil Seal	1	PD90×110×12	HG4-692-67	034621755520
21	Klemmblock	Locking Block	1		C6251A-08A-05	034621755521
22	Schraube	Screw Bolt	1		C6251A-08B-03	034621755522
23	Unterlegscheibe	Washer	1		C6266-08-05	034621755523
24	Schraube	Screw	2	M8×30	GB/T70	
25	Schraube	Screw	1	M16×30	GB/T80	
26	Stift	Pin	1	12×100	GB/T119.2	034621755526
27	Mutter	Nut	1	M20	GB/T56	
28	Unterlegscheibe	Washer	1	20	GB/T95	
29	Niet	Rivet	4	2×5	GB/T827	
30	Skalenplatte des Reitstocks	Rating Plate Of Tailstock	1		RUN460-105031	034621755530
31	Bremsschraube	Brake Screw Bolt	1		RUN460-105007	034621755531
32	Einstellstück	Adjusting Piece	1		RUN460-105017	034621755532
33	Skalenplatte des Reitstocks	Rating Plate Of Tailstock	1		RUN460-105032	034621755533
34	Staubdichte Oldichtung	Dustproof Oil Seal	2		C6251A-08-09	034621755534
35	Fixierstück	Fixing Piece	2		C6251A-08-08	034621755535
36	Schraube	Screw	8	M4×12	GB/T818	
37	Fixierstück	Fixing Piece	2		C6251A-08-07	034621755537
38	Staubdichte Oldichtung	Dustproof Oil Seal	2		C6251A-08-06	034621755538
39	Unterlegscheibe	Washer	2	12	GB/T95	
40	Schraube	Screw Bolt	2	M12×115	GB/T5782	
41	Schraube	Screw	1	M10×16	GB/T79	
42	Stift	Pin	1	12×100	GB/T119.2	
43	Schraube	Screw	1	M16×30	GB/T80	
44	Stützhalterung	Supporting Bracket	1		RUN460-105018	034621755544
45	Exzenterblock	Eccentric Block	1		RUN460-105028	034621755545
46	Bremsschraube	Brake Screw Bolt	1		C6251A-08-04	034621755546
47	Schraube	Screw	1	M6×10	GB/T80	
48	Anschlagblock	Limit Block	1		C6246B-105030	034621755548
49	Schraube	Screw Bolt	1		RUN460-105006-1	034621755549
50	Stift	Pin	1	6×36	GB/T879.1	
51	Schraube	Screw Bolt	1	M20×200	GB/T37	
52	Schraube	Screw Bolt	1	M20×150	GB/T5782	
53	Unterlegscheibe	Washer	1	20	GB/T95	
54	Bremsblock	Brake Block	2		C6251A-08-03	034621755554
55	Grundrahmen	Base Frame	1		CQ6261-08-02	034621755555
56	Leisten	Gibs	1		C6246B-105012	034621755556
57	Einstellschraube	Adjusting Screw	2		RUN460-105020	034621755557
58	Unterlegscheibe	Washer	1	6	GB/T95	
59	Schraube	Screw	1	M6×10	GB/T70	

W Maschinenbett, Vorschub, Abdeckungen - Machine bed, feed, covers



Img.8-15: Maschinenbett, Vorschub, Abdeckungen - Machine bed, feed, covers

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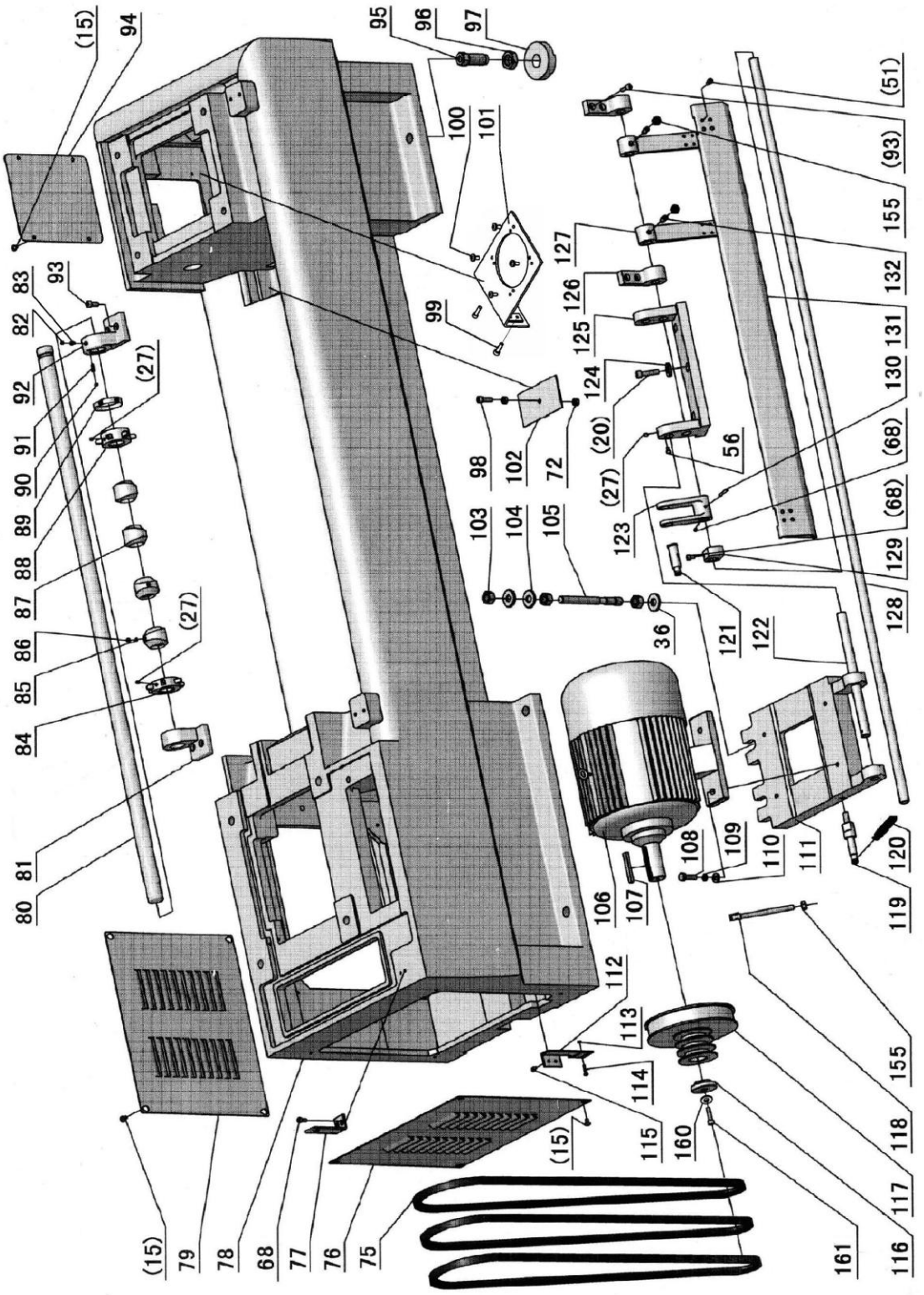
X Spindelbremse, Antrieb - Spindle break, drive



Img.8-16: Spindelbremse - Spindle break

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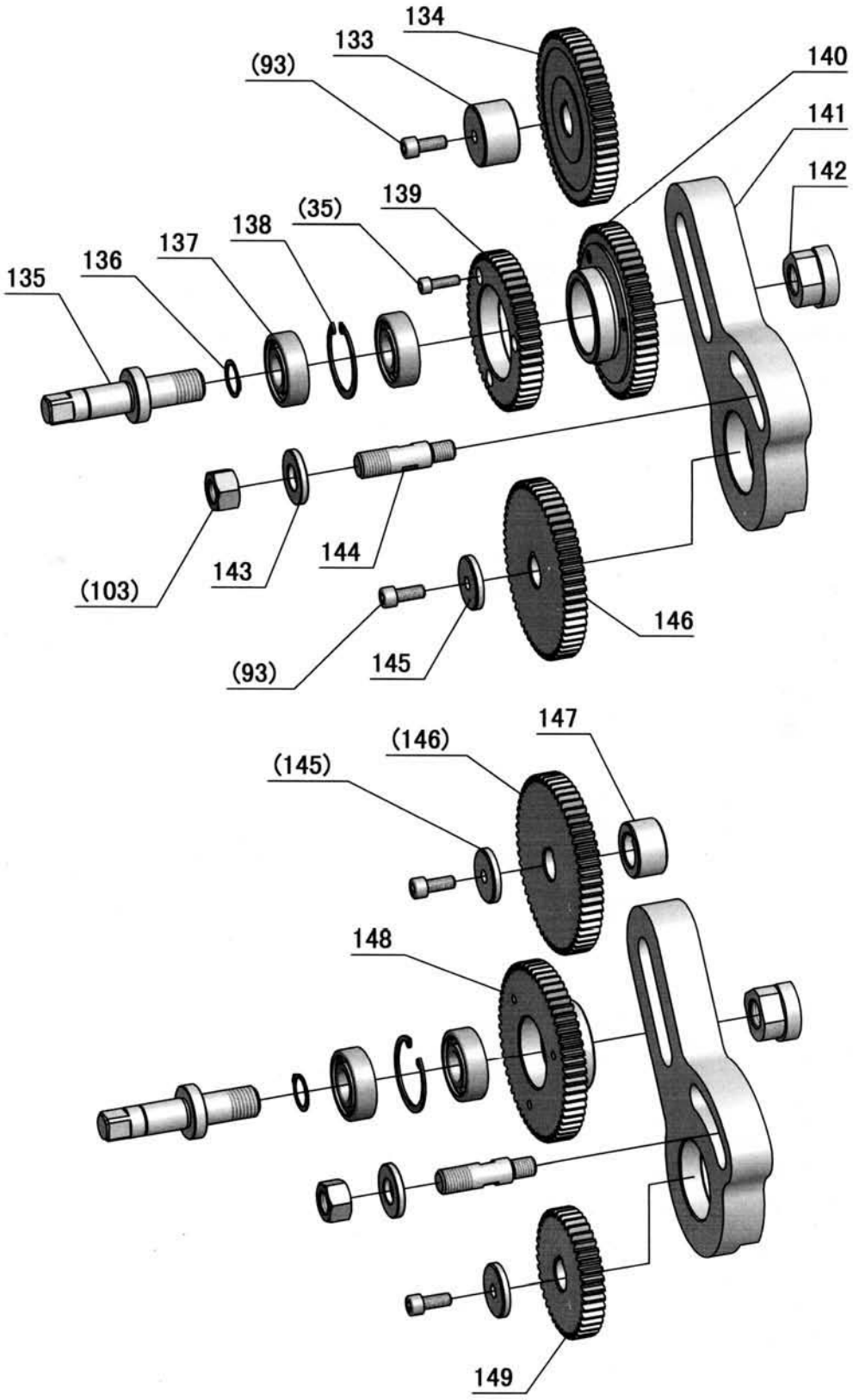
Y Wechselradgetriebe (Metrisch) - Change wheel gear (Metric)



Img.8-17: Wechselradgetriebe (metrisch) - Change whell gear (metric)

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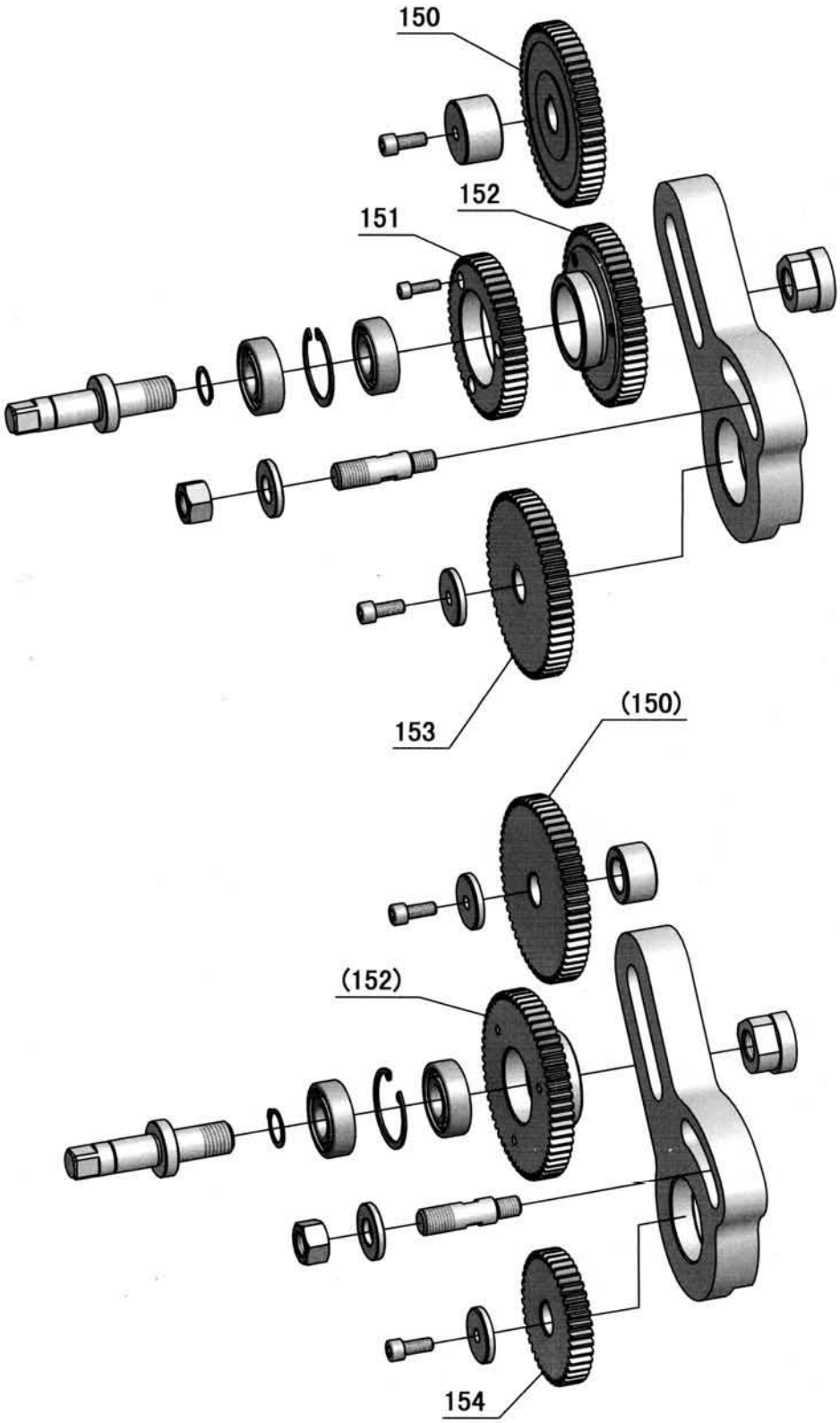
Z Wechselradgetriebe (Inch) - Change wheel gear (Inch)



Img.8-18: Wechselradgetriebe (Inch) - Change whell gear (Inch)

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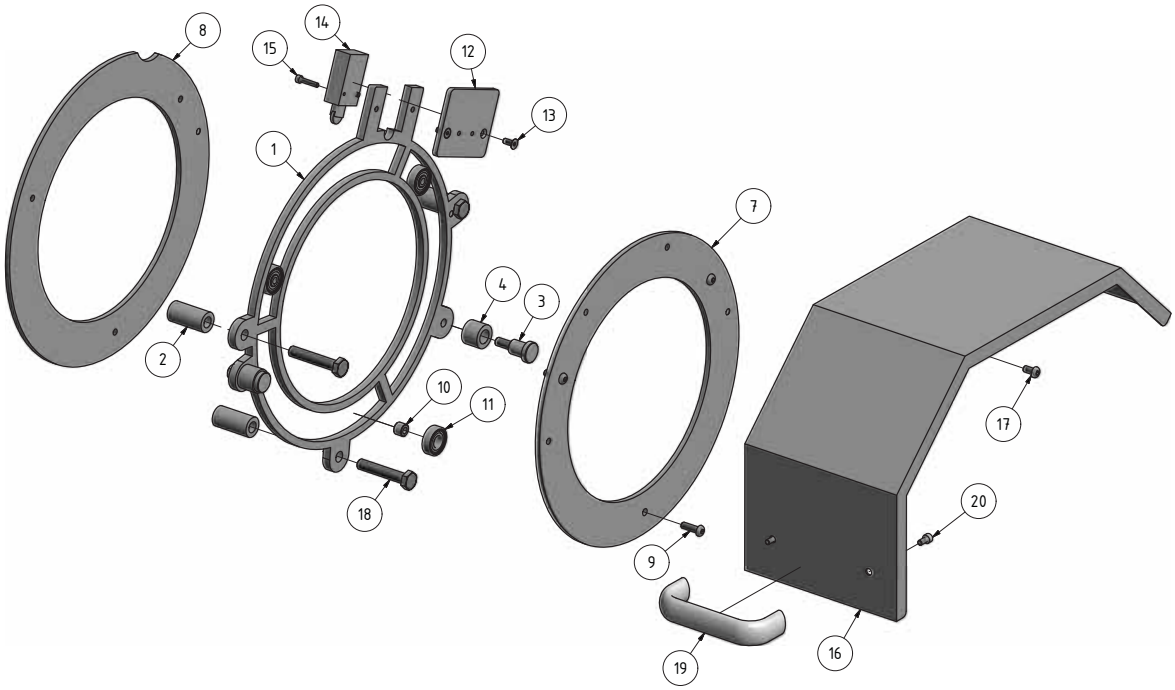
Ersatzteilliste Wechselradgetriebe, Spindelbremse, Maschinenbett - Spare parts list change wheel gear, spindle break, lathe bed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
1	Olschutz	Oil Guard	1		C6256A-01-20	034621756601
2	Schraube	Screw	2	M6×10	GB70-85	
3	Platte	Plate	1		RUN6246-108094	034621756603
4	Schraube	Screw	1		C6251A-05-12	034621756604
5	Schraube	Screw	1		RUN6246-108074	034621756605
6	Mutter	Nut	1		RUN6246-108073	034621756606
7	Schraube	Screw	1	M6×8	GB80-85	
8	Endabdeckung	Cover-End	1		C6256E-04-45	034621756608
9	Platte (Metrisch)	Plate (Metric)	1		C6251A-04-04	
9	Platte (Zoll)	Plate (Inch)	1		C6251A-04-04Y	
10	Abdeckung	Cover	1		C6251A-04-05	034621756610
11	Schraube	Screw	1	M6×10	GB/T70.2-2000	
12	Scharnier	Hinge	2	100	GB7277-87	034621756612
13	Schraube	Screw	12	M5×10	GB68-85	
14	Ständer	Stand	1		C6251D-01-09	034621756614
15	Schraube	Screw	12	M6×10	GB818-85	
16	Bettbrücke	Bed Gap	1		C6251D-01-02	034621756616
17	Stift	Pin	2	10×70	GB118-86	
18	Schraube	Screw	2	M6×10	GB73-85	
19	Schraube	Screw	4	M12×50	GB70-85	
20	Schraube	Screw	7	M10×40	GB70-85	
21	Schutzblechbaugruppe 2000	Guard Assembly 2000	1		C6251D-01-06-2	034621756621
22	Schraube	Screw	4	M8×16	GB70-85	
23	Bett 2000	Bed 2000	1		C6251D-01-01-2	034621756623
24	Schraube	Screw	4	M16×40	GB70-85	
25	Verschlussstopfen Ol Einlass	Plug-Oil Inlet	1		RUN6246-106010-4	034621756625
26	Halterung	Bracket	1		C6251A-01-07	034621756626
27	Schraube	Screw	4	M6×8	GB80-85	
28	Mutter	Nut	1		C6251A-01-04	034621756628
29	Abdeckung	Cover	1		RUN6246-106031	034621756629
30	Schraube	Screw	2	M5×8	GB818-85	
31	Verschlusskappe	Plug	1		RUN6246-106010-1	034621756631
32	Verschlusskappe	Plug	1		RUN6246-106010-2	034621756632
33	Kegelstift	Taper Pin	2	8×50	GB118-86	
34	Schraube	Screw	6	M16×40	GB70-85	
35	Schraube	Screw	3	M6×20	GB70-85	
36	Unterlegscheibe	Washer	2	16	GB93-87	
38	Schraube	Screw	2	M8×20	GB70-85	
39	Schutzabdeckung	Protection Cover	1		RUN6246-106009	034621756639
40	Federstift	Spring Pin	6	5×30	GB879-86	
41	Schraube	Screw	8	M6×25	GB70-85	
42	Zahnstange (Handrad links)	Rack (Left Hand)	1		C6251A-01-05	034621756642
42	Zahnstange	Rack	1		RUN6246-106005B	
42	Zahnstange	Rack	1		RUN6246-106005C	034621756642
43	Drucklager	Thrust Bearing	2	8105	GB301-84	034621756643
44	Buchse	Bush	1		C6251A-01-07-1	034621756644
45	Distanzstück	Spacer	1		RUN6246-106010-7	034621756645
46	Buchse	Bush	1		RUN6246-106008	034621756646
47	Wellemhülse	Shaft Sleeve	1		RUN6246-106056	034621756647
48	Unterlegscheibe	Washer	1		RUN6246-106058	034621756648
49	Feder	Spring	3	1×6×20	Q81-1	034621756649
50	Schalterhalterung	Switch Bracket	1		RUN6246-106059	034621756650
51	Schraube	Screw	12	M6×16	GB70-85	
52	Stift	Pin	1		RUN6246-106055	034621756652
53	Halterung	Bracket	1		RUN6246-106053	034621756653
54	Federstift	Spring Pin	1	3×20	GB879-86	
55	Hebel	Lever	1		RUN6246-106057A	034621756655
56	Schraube	Screw	2	M5×10	GB70-85	
57	Stift	Pin	1	M12×50	GB878-86	
58	Abdeckung	Cover	1		RUN6141-106018-1	034621756658
59	Halterung Kontrolleuchte	Seat-Pilot Light	1		C6241D-01-04	034621756659
60	Schraube	Screw	2	M6×70	GB70-85	
61	Schraube	Screw	2	M4×40	GB70-85	
62	Schraube	Screw	2	M8×25	GB70-85	
63	Halterung Schalter	Seat-Switch	1		C6251D-01-05	034621756663
64	Schalthebelstange 2000	Started Rod 2000	1		C6251A-01-09-2	034621756664
65	Zugspindel 2000	Feed Rod 2000	1		C6251A-01-08-2	034621756665
66	Leitspindel 2000 (Metrisch)	Lead Screw 2000 (Metric)	1		C6251A-01-06-2	034621756666
66	Leitspindel 2000 (Zoll)	Lead Screw 2000 (Inch)	1		C6251A-01-06Y-2	
67	Nocke	Cam	1		CM6233-2055	034621756667
68	Schraube	Screw	5	M6×12	GB70-85	
69	Schraube	Screw	12	2×5	GB827-86	

Ersatzteilliste Wechselradgetriebe, Spindelbremse, Maschinenbett - Spare parts list change wheel gear, spindle break, lathe bed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
70	Platte	Plate	1		RUN6246-106089	034621756670
71	Schraube	Screw	2	M8×30	GB79-85	
72	Mutter	Nut	4	M8	GB6170-86	
73	Buchse Hebel	Lever Bush	1	M12×40	Z16-1	034621756673
74	Buchse	Bush	1		RUN6246-106014	034621756674
75	Riemen (C6251V)	Belt (C6251V)	3	B77	GB1171-74	
75	Riemen (C6256V)	Belt (C6256V)	3	B79	GB1171-74	034621756675
76	Abdeckung Motor Sitz	Cover Motor Seat	1		C6251D-01-04	034621756676
77	Sitz für Endlagenschalter	Limited Switch Seat	1		RUN6246-108078	034621756677
78	Maschinenbett 2000	Stand 2000	1		C6251D-01-03-2	034621756678
79	Abdeckung Motor Sitz	Cover Motor Seat	1		RUN6246-106028-1	034621756679
80	Vorschub Abschaltstange 2000	Auto Stopping Rod 2000	1		C6251A-01-10-2	034621756680
81	Halterung	Bracket	1		RUN6141-106024	034621756681
82	Schraube	Screw	1	M8×12	GB79-85	
83	Schraube	Screw	1	M8×6	GB77-85	
84	Sterntyp Ring	Star Type Ring	1		RUN6246-106019-1	034621756684
85	Schuhklemme	Shoe Clamp	5		RUN6246-106020-1	034621756685
86	Schraube	Screw	5	M8×6	GB77-85	
87	Nocke	Cam	4		RUN6246-106020	034621756687
88	Sterntyp Ring	Star Type Ring	1		RUN6246-106019-2	034621756688
89	Platte	Plate	1		RUN6246-106019-5	034621756689
90	Stahlkugel	Steel Ball	1	6	GB308-84	034621756690
91	Feder	Spring	1	0.9×5×25	Q81-1	034621756691
92	Halterung	Bracket	1		RUN6141-106025	034621756692
93	Schraube	Screw	10	M8×20	GB70-85	
94	Pumpenlochabdeckung	Pump Hole Cover	1		RUN6246-106033	034621756694
95	Schraube	Bolt	6		RUN6246-106029	034621756695
96	Mutter	Nut	6	M24×2	GB6173-86	
97	Stellscheibe	Block-Leveling	6		RUN6246-106069	034621756697
98	Schraube	Screw	1	M8×30	GB70-85	
99	Schraube	Screw	2	M6×25	GB70-85	
100	Schraube	Screw	4	M6×10	GB818-85	
101	Sitz Kühlmittelpumpe	Coolant Pump Seat	1		C6251A-01-17-5	0346217566101
102	Spaltfilter	Screen	1		RUN6246-106051	0346217566102
103	Mutter	Nut	7	M16	GB6170-86	
104	Unterlegscheibe	Washer	4		RUN6246-106079	0346217566104
105	Schraube	Screw	2		RUN6246-106046	0346217566105
106	Motor	Motor	1	7.5kw	Y132M-4	0346217566106
107	Passfeder	Key	1	10×70	GB1096C-79	0346217566107
108	Schraube	Bolt	4	M10×35	GB5782-86	
109	Federscheibe	Spring Washer	4	10	GB93-87	0346217566109
110	Unterlegscheibe	Washer	4	10	GB97.1-86	
111	Motor Sitz	Motor Seat	1		RUN6246-106034	0346217566111
112	Sitz für Endlagenschalter	Limited Switch Seat	1		RUN6246-106091	0346217566112
113	Mutter	Nut	2	M4	GB6170-86	
114	Schraube	Screw	2	M4×20	GB818-85	
115	Schraube	Screw	3	M5×8	GB70-85	
116	Unterlegscheibe	Washer	1		RUN6141-106049a	0346217566116
117	Riemenscheibe	Belt Pulley	1		C6241V-01-01	0346217566117
118	Schraube	Screw	1	M10×35	GB70-85	
119	Welle	Shaft	1		RUN6246-106050	0346217566119
120	Feder	Spring	1	3×16×115	Q81-3	0346217566120
121	Welle	Shaft	1		RUN6246-106039	0346217566121
122	Welle	Shaft	1		RUN6246-106044	0346217566122
123	Arm für Bremse	Arm Brake	1		RUN6246-106040	0346217566123
124	Unterlegscheibe	Washer	3		RUN6246-106097	0346217566124
125	Klammer Motor Sitz	Bracket-Motor Seat	1		RUN6246-106041	0346217566125
126	Halterung	Bracket	2		RUN6246-106036	0346217566126
127	Arm	Arm	2		RUN6246-106042A	0346217566127
128	Welle 2000	Shaft 2000	1		C6251A-01-14-2	
129	Nocke	Cam	1		RUN6246-106037	
130	Federstift	Spring Pin	1	5×40	GB879-86	
131	Bremspedal 2000	Pedal-Brake 2000	1		C6251A-01-13-2	0346217566131
132	Schraube	Screw	2	M10×25	GB79-85	
133	Distanzstück	Spacer	1		RUN6141-108002	0346217566133
134	Zahnrad	Gear	1	55T×M2.25	C6251A-04-03	0346217566134
134	Zahnrad	Gear	1	55T×M2.5	C6256A-04-03	0346217566134
135	Schraube	Bolt	1		RUN6141-108004	0346217566135
136	Sicherungsring	Snap Ring	1	20	GB894.1-86	
137	Kugellager	Ball Bearing	2	180204	GB278-89	0346217566137
138	Sicherungsring	Snap Ring	1	47	GB893.1-86	
139	Zahnrad	Gear	1	49T	C6251A-05-10	0346217566139

Ersatzteilliste Wechselradgetriebe, Spindelbremse, Maschinenbett - Spare parts list change wheel gear, spindle break, lathe bed						
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**		**Artikelnummer Item no.**
140	Zahnrad	Gear	1	54T	C6251A-05-11	0346217566140
141	Halterung	Bracket	1		C6251A-05-08	0346217566141
142	Mutter	Nut	1		RUN6141-108005	0346217566142
143	Unterlegscheibe	Washer	1		RUN6141-108017	0346217566143
144	Schraube	Bolt	1		C6251A-05-01	0346217566144
145	Distanzstück	Spacer	1		RUN6141-108007	0346217566145
146	Zahnrad	Gear	1	56T	C6251A-05-07	0346217566146
147	Distanzstück	Spacer	1		RUN6141-108015	0346217566147
148	Zahnrad (metrische Tabelle)	Gear (metric table)	1	57T	C6251A-05-11Y	0346217566148
149	Zahnrad (metrische Tabelle)	Gear (metric table)	1	40T	C6251A-15-01	0346217566149
150	Zahnrad (Zoll Tabelle)	Gear (inch table)	1	48T	C6251A-04-03Y	
151	Zahnrad (Zoll Tabelle)	Gear (inch table)	1	66T	C6251A-15-02Y	
152	Zahnrad (metrische Tabelle)	Gear (metric table)	1	57T	C6251A-05-11Y	0346217566152
153	Zahnrad (Zoll Tabelle)	Gear (inch table)	1	42T	C6251A-15-01Y	
154	Zahnrad (metrische Tabelle)	Gear (metric table)	1	57T	C6251A-05-07Y	0346217566154
155	Mutter	Nut	3	M10	GB6170-86	
156	Schraube	Screw	2	M5×8	GB73-85	
157	Stift	Pin	2	8×40	GB118-86	
158	Unterlegscheibe	Washer	4	8	GB97.1-85	
159	Schraube	Screw	3	M5×8	GB818-85	
160	Federscheibe	Spring Washer	3	8	GB93-87	
161	Schraube	Screw	1	M8×40	GB70-85	
162	Platte	Plate	1		RUN6246-106010-8	0346217566162

AA Drehfutterschutz - Chuck protection

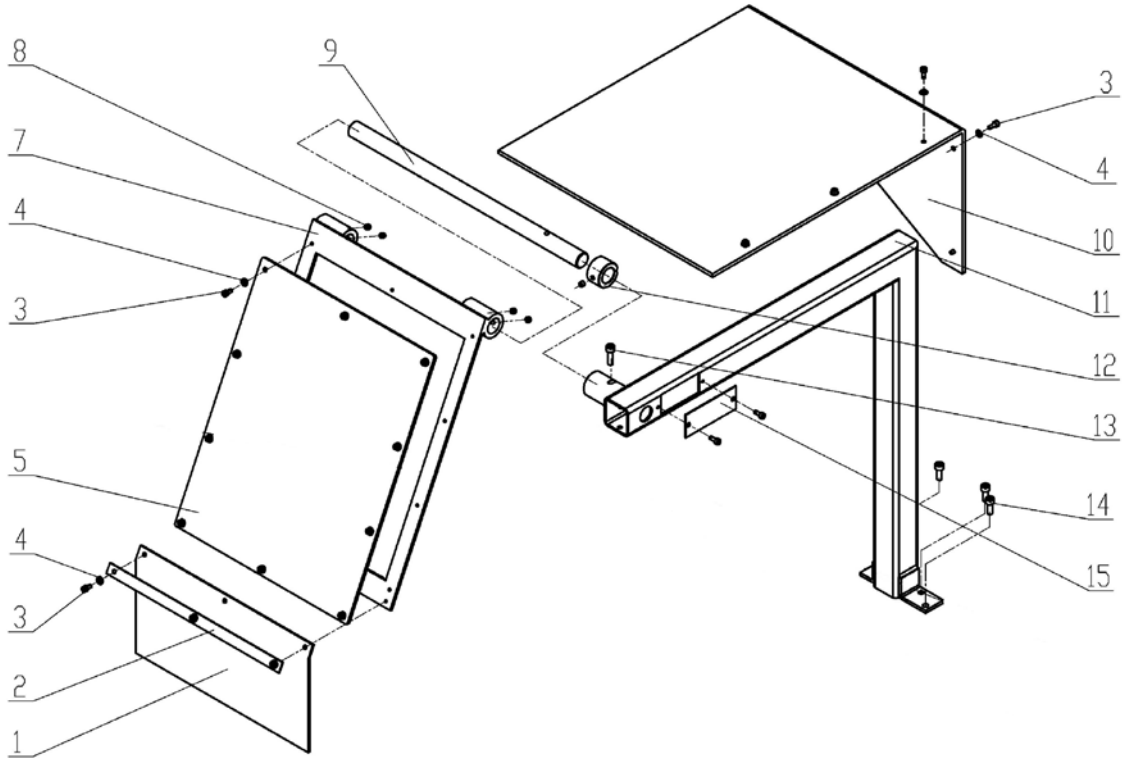


Img.8-19: Drehfutterschutz - Chuck protection

Ersatzteilliste Drehfutterschutz - Spare parts list chuck protection					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Führungsring	Guide ring	1		034621753001
2	Hülse	Sleeve	3		034621753002
3	Bolzen	Bolt	2		034621753003
4	Buchse	Bushing	2		034621753004
5	Scheibe	Washer	2	DIN 125 - A 8,4	
6	Sechskantmutter	Hexagon nut	2	ISO 4032 - M8	
7	Ring	Ring	1		034621753007
8	Ring	Ring	1		034621753008
9	Schraube	Screw	3	ISO 7380 - M6 x 20	
10	Lagerbuchse	Bearing bushing	3		034621753010

Ersatzteilliste Drehfutterschutz - Spare parts list chuck protection					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
11	Kugellager	Ball bearing	3	6001-2Z	0406001
12	Platte	Plate	1		034621753012
13	Schraube	Screw	2	DIN 7991 - M5x12	
14	Schalter	Switch	1		034621753014
15	Schraube	Screw	2	ISO 4762 - M4 x 20	
16	Schutzhaube	Protective cover	1		034621753016
17	Schraube	Screw	3	M6 x 1 x 12	
18	Schraube	Screw	3	ISO 4017 - M10 x 55	
19	Griff	Grip	1		034621753019
20	Schraube	Screw	2	ISO 4762 - M5 x 10	

AB Späneschutz - Chip protection



Img.8-20: Späneschutz - Chip protection

Ersatzteilliste Späneschutz - Spare part list chip protection					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Späneabdeckung	Chip Cover	1		034621757701
2	Klemmung	Clamp	1		034621757702
3	Schraube	Screw	21	M4×10 (GB70-85)	
4	Scheibe	Washer	18	4 (GB97.1-85)	
5	Spänedeckel	Chip Cover	1		034621757705
7	Befestigungsplatte Späneabdeckung	Chip Cover Fixing Plate	1		034621757707
8	Schraube	Screw	5	M6×6 (GB80-859	
9	Welle	Shaft	1		034621757709
10	Obere Deckelplatte	Top Cover Plate	1	Select Purchase	034621757710
11	Befestigungsbügel	Main Block	1		034621757711
12	Schloss für Verriegelung	Lock for Switch Stop	1		034621757712
13	Schraube	Screw	1	M6×20 (GB70-85)	
14	Schraube	Screw	3	M6×16 (GB70-85)	
15	Platte Späneabdeckung	Chip Cover Plate	1		034621757715
ohne Abbildung / without illustration					
0	Arbeitslampe komplett	Working lamp complete	1	PGB-350-12W 1200 lumens, Input AC/DC 24V	0346217540055

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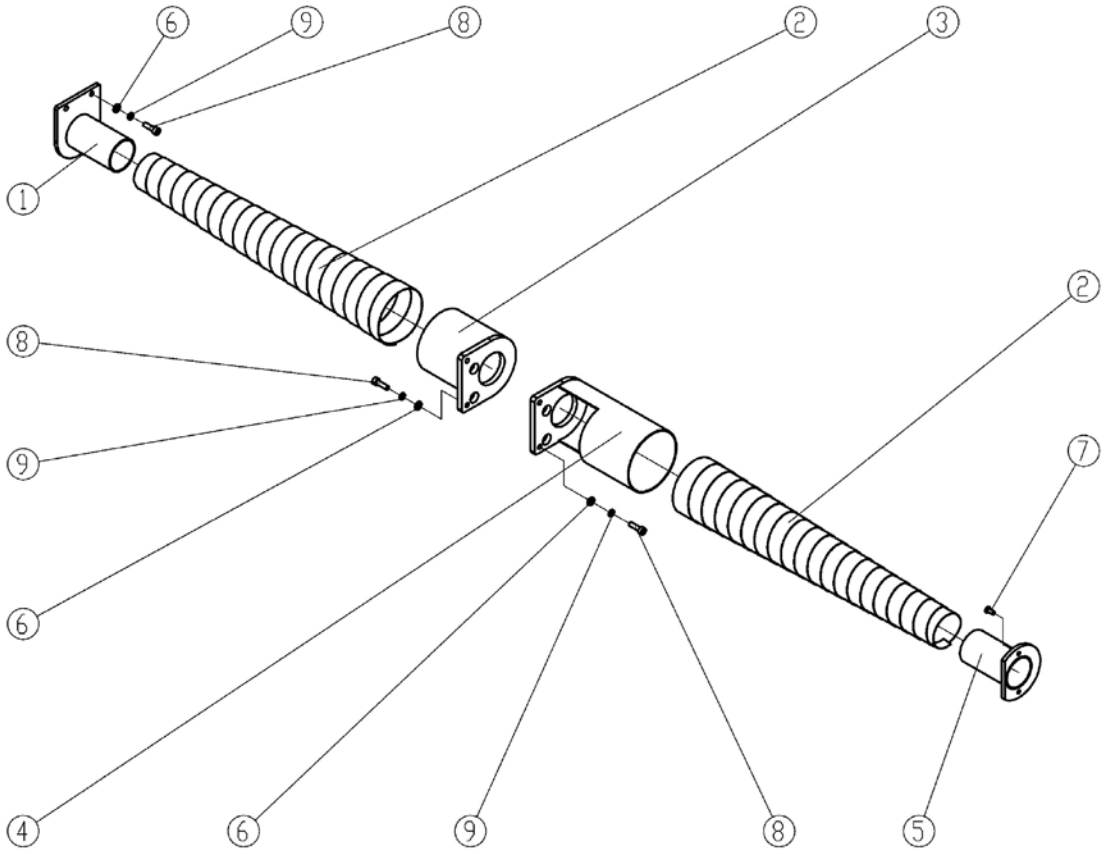
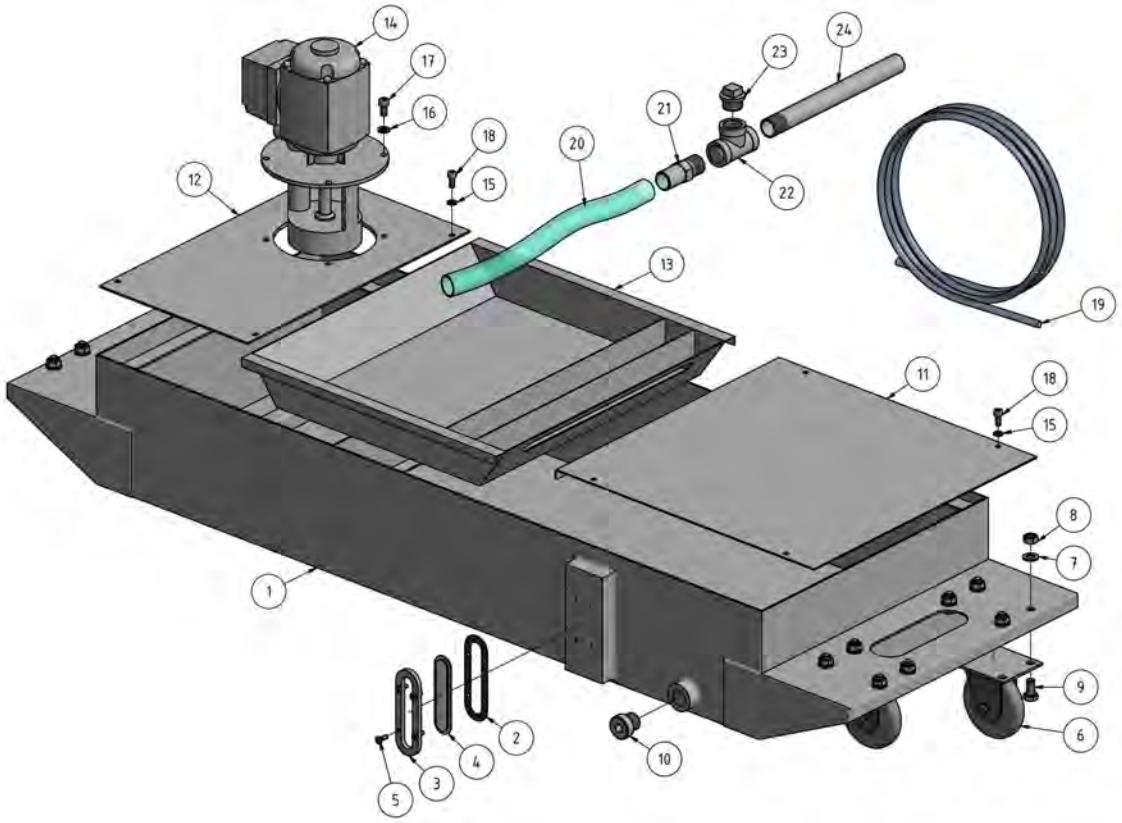
AC Abdeckung Leitspindel - Lead screw guard



Img.8-21: Späneschutz - Chip protection

Ersatzteilliste Abdeckung Leitspindel - Spare parts lead screw guard					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Verbindungshülse	Connect Sleeve	1		034621755001
2	Schutzhülse	Protect Sleeve	2	2000	034621705002
3	Verbindungshülse	Connect Sleeve	1	2000	034621705003
4	Verbindungshülse	Connect Sleeve	1	2000	034621705004
5	Verbindungshülse	Connect Sleeve	1		034621755005
6	Scheibe	Flat Washer	6	6 (GB97.1-85)	
7	Schraube	Screw	2	M5x12 (GB819-85)	
8	Zylinderschraube	Socket Cap Screw	6	M6x20 (GB70-85)	
9	Federscheibe	Spring Washer	6	6 (GB93-87)	

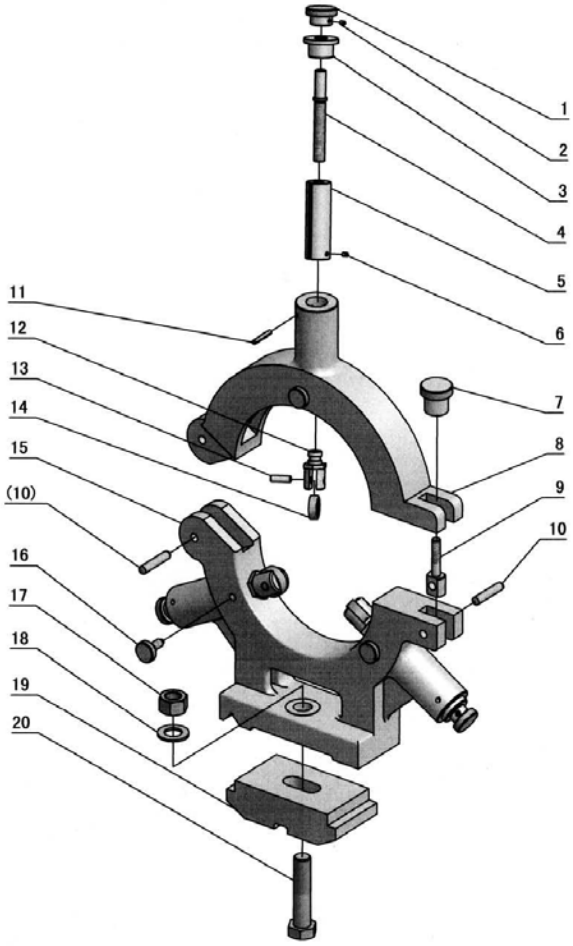
AD Externer Kühlmitteltank - External coolant tank



Img. 8-22: Kühlmitteltank - Coolant tank

Ersatzteile Kühlmitteltank - Spare parts coolant tank					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Kühlmittelbehälter	Coolant liquid tank	1		03461150CT01
2	Dichtung	Seal	1		03461150CT02
3	Halter Schauglas	Sight glass holder	1		03461150CT03
4	Schauglas	Sight glass	1		03461150CT04
5	Schraube	Screw	4	DIN 7047-M4x12	
6	Rolle	Roll	4		03461150CT06
7	Scheibe	Washer	16	DIN 125 - A 8,4	
8	Sechskantmutter	Hexagon nut	16	ISO 4032 - M8	
9	Sechskantschraube	Hexagon screw	16	ISO 4017 - M8 x 16	
10	Ablassschraube	Drain screw	1		03461150CT10
11	Blech	Sheet plate	1		03461150CT11
12	Motorplatte	Motor plate	1		03461150CT12
13	Sieb	Filter	1		03461150CT13
14	Kühlmittelpumpe	Coolant pump	1		03461150CT14
15	Scheibe	Washer	8	DIN 125 - A 5,3	
16	Scheibe	Washer	4	DIN 125 - A 6,4	
17	Innensechskantschraube	Hexagon socket screw	4	ISO 4762 - M6 x 12	
18	Innensechskantschraube	Innensechskantschraube	8	ISO 4762 - M5 x 12	
19	Kühlmittelschlauch	Coolant hose	1		03461150CT19
20	Kühlmittelschlauch	Coolant hose	1		03462175CT20
21	Adapter	Adapter	1		03462175CT21
22	T-Stück	T-fiiting	1		03462175CT22
23	Stopfen	Plug	1		03462175CT23
24	Rohr	Pipe	1		03462175CT24

AF Feststehende Lünette - Steady rest



Img.8-23: Feststehende Lünette - Steady rest

Ersatzteilliste feststehende Lünette - Spare part list steady rest					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Griff	Rotate Handle	3		034626151101
2	Schraube	Screw	3	GB78-85/M5x8	
3	Buchse	Bush	3		034626151103
4	Schraubenwelle	Screw Shaft	3		034626151104
5	Hülse	Sleeve	3		034626151105
6	Schraube	Screw	3	GB77-85/M6x8	
7	Knopf	Handle	1		034626151107
8	Oberteil Lünette	Upside Of Steady Reat	1		034626151108
9	Klemmschraube	Clamping Screw	1		034626151109
10	Stift	Pin	2	GB119-86/10x60	
11	Federstift	Spring Pin	3	GB879-86/5x50	
12	Welle	Support Shaft	3		034626151112
13	Stift	Pin	3		034626151113
14	Kugellager	Ball Bearing	3	6300R	0406300R
15	Unterteil Lünette	Downside Of Steady Rest	1		034626151115
16	Stellschraube	Limited Screw	3		034626151116
17	Mutter	Nut	1	GB55-88/M20	
18	Scheibe	Washer	1	GB97.2-85/20	
19	Klemmstock	Clamping Bracket	1		034626151119
20	Bolzen	Bolt	1	GB37-88/M20x110	034626151120
0	Feststehende Lünette kplt.	Steady rest complete			034626151108CPL

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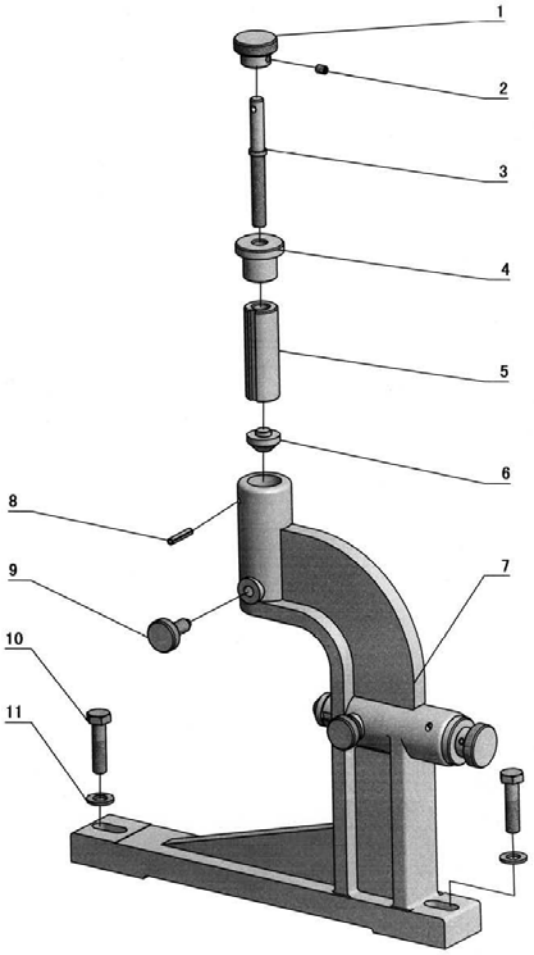
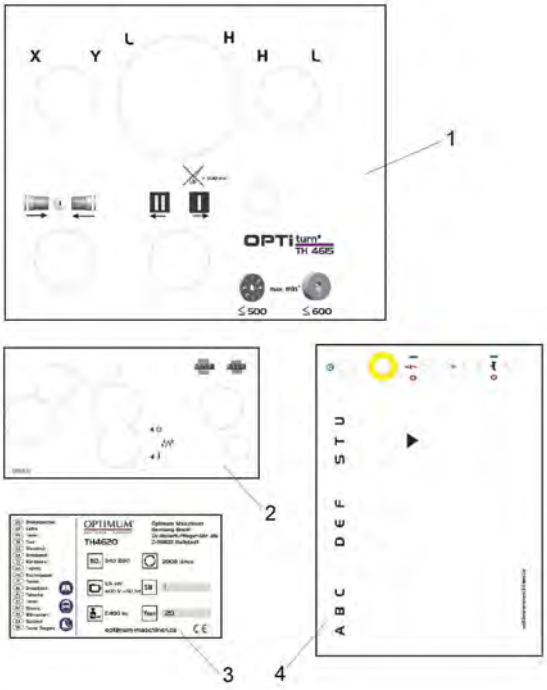
AG Mitlaufende Lünette - Follow rest



Img.8-24: Mitlaufende Lünette - Follow rest

Ersatzteilliste mitlaufende Lünette - Spare part list follow rest					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Griff	Rotate Handle	2		034626151201
2	Schraube	Screw	2	GB78-85/M6x8	
3	Schraubenwelle	Screw Shaft	2		034626151203
4	Buchse	Bush	2		034626151204
5	Hülse	Sleeve	2		034626151205
6	Halter	Bracket	2		034626151206
7	Lünette	Follow Rest	1		034626151207
7	Lünette	Follow Rest	1		
8	Federstift	Spring Pin	2	GB879-86/5x26	034626151209
9	Stellschraube	Limited Screw	2		
10	Bolzen	Bolt	2	GB5782-86/M10x40	
11	Scheibe	Washer	2	GB97.1-85/10	034626151201
0	Mitlaufende Lünette kplt.	Follow rest complete			034626151207CPL

AH Maschinenschilder - Machine labels



Img.8-25: Maschinenschilder - Machine labels

Maschinenschilder - Machine labels					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
1	Label Spindelstock	Headstock lable	1	TH5620V	03462175L01
2	Label Schlosskasten	Apron lable	1	TH5620V	03462175L02
3	Maschinenlabel	Machine lable	1	TH5620V	03462175L03
4	Label Vorschubgetriebe	Feed box lable	1		03462175L04
5	Label Gewindeuhr	Thread gauge lable	1		03462175L05
6	Wechselradtabelle metrische Leitspindel	Change gear table metric lead screw	1		03462175L06
7	Infolabel	Info lable	1		03462175L07
8	Infolabel	Info lable	1		03462175L08
9	Infolabel	Info lable	1		03462175L09
10	Infolabel	Info lable	1		03462175L10
11	Label Hauptschalter	Main switch lable	1		03462175L11
12	Label Vorschub	Feed lable	1		03462175L12
13	Infolabel	Info lable	1		03462175L13
14	Infolabel	Info lable	1		03462175L14
15	Infolabel	Info lable	1		03462175L15
16	Infolabel	Info lable	1		03462175L16
17	Infolabel	Info lable	1		03462175L17
18	Label Drehrichtung	Rotating direction	1		03462175L18

AK Wegmeßsystem - Path measurement system

Ersatzteilliste Wegmeßsystem - Spare part list path measurement system					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
	Digitalanzeige	Digital indicator	1	DPA32-3	03403027DPA32
2	Aktiver Lesekopf Magnetband X und Z_0 Achse	Active read head Magnetic tape X and Z_0 axis	2		3384035
1	TH5620 Kugelmessleiste MSS31 Z-Achse	TH5620 Ball measuring bar MSS31 Z axis	1		
	Magnetband X und Z_0 Achse	Magnetic tape X and Z_0 axis	2	1100mm	3383978

SWH 7-C

SWH 7-C					
Pos.	Bezeichnung	Designation	Menge Qty.	Größe Size	Artikelnummer Item no.
1	Schnellwechselaufnahme A	Quick- action collet A	1		0338430701
2	Schnellwechselaufnahme B	Quick- action collet B	1		0338430702
4	Spannschraube	Clamp screw	1		0338430704
5	Schmiernippel	Lubrication cup	1		0338430705
6	Bolzen	Bolt	1		0338430706
7	Feder	Spring	1		0338430707
8	Nutenstein	Slot nut	3		0338430708
9	Zahnkranz	Crown gear	1		0338430709
10	Anzeigeskala	Indicator scale	1		0338430710
11	Buchse	Bushing	1		0338430711
12	Ring	Ring	1		0338430712
13	Zeiger	Indicator	1		0338430713
14	Stahlhalter Vierkantmeißel, Typ D	Holder square tool, Typ D	1		3384308
15	Klemmschraube	Locking screw	3	M14x40	0338430715
16	Oberteil Höhenverstellung	Top adjustment of height	1		0338430716
17	Schraube	Screw	2		0338430717
18	Höhenverstellschraube	Screw adjustment of height	1		0338430718
19	Kontermutter	Counter nut	1		0338430719
20	Hebel	Lever	1		0338430720
21	Kugelknopf	Ball knob	1		0338430721
22	Schlüssel	Key	1		0338430722
	Stahlhalter Rundmeißel, Typ H	Holder round tool, Typ H	1		3384326

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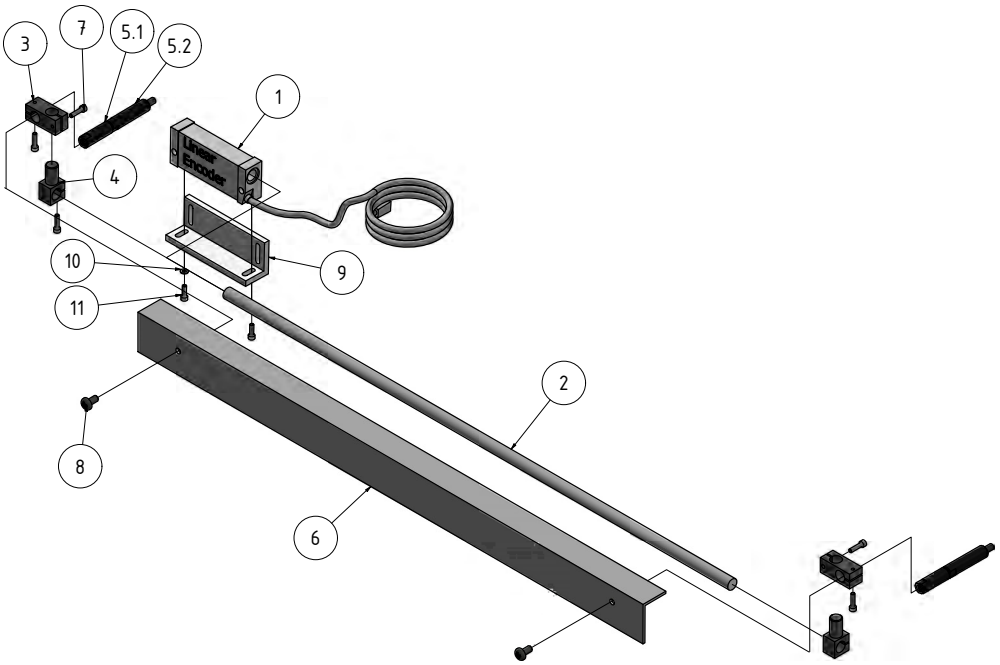
8.5 MSSR Linear Encoder - Ersatzteilzeichnungen - Spare part drawings

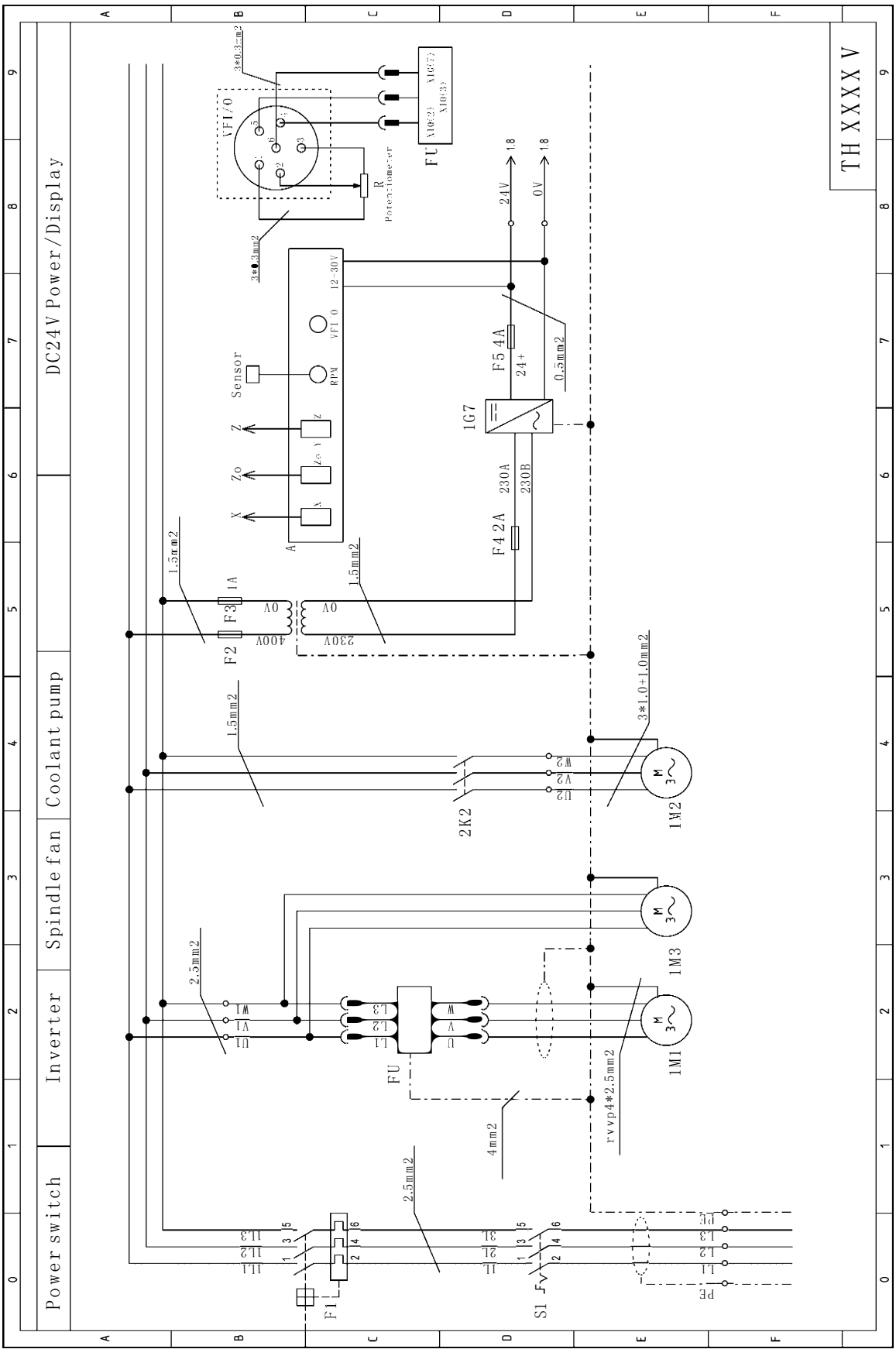
A Großer MSSR Messwandler - Large Linear encoder



Teileliste - Parts list					
Pos.	Bezeichnung	Description	Menge Qty.	Grösse Size	Artikelnummer Item no.
01	Lesekopf	Reading head	1		0338440501
02	Kugelmessleiste	Ball measuring bar	1	verschiedene Längen different lengths	
03	Anschlussblock zur Aufnahme von Maßstab und Vorrichtung	Connection block for holding scale and fixture	2		0338440503
04	Fester Block für Maßstab und Halterung	Fixed block for scale and holder	2		0338440504
05.1	Installationssäule für Maßstab (vorne)	Installation column for scale (front)	2		0338440505-1
05.2	Installationssäule für Maßstab (hinten)	Installation column for scale (rear)	2		0338440505-2
06	Abdeckplatte für Maßstab und Halterung	Cover plate for scale and holder	1	verschiedene Längen different lengths	
07	Schraube M5 x 20	Screw M5 x 20	6	DIN EN ISO 4762 M5 x 20	
08	Schraube M8 x 16	Screw M8 x 16	2	DIN EN ISO 7045 Z M8 x 16	
09	Winkelhalterung	Angle holder	1		0338440509
10	Beilegscheibe	Washer	2	DIN 988 S6	
11	Schraube M6 x 25	Screw M6 x 25	2	DIN EN ISO 4762 M6 x 25	

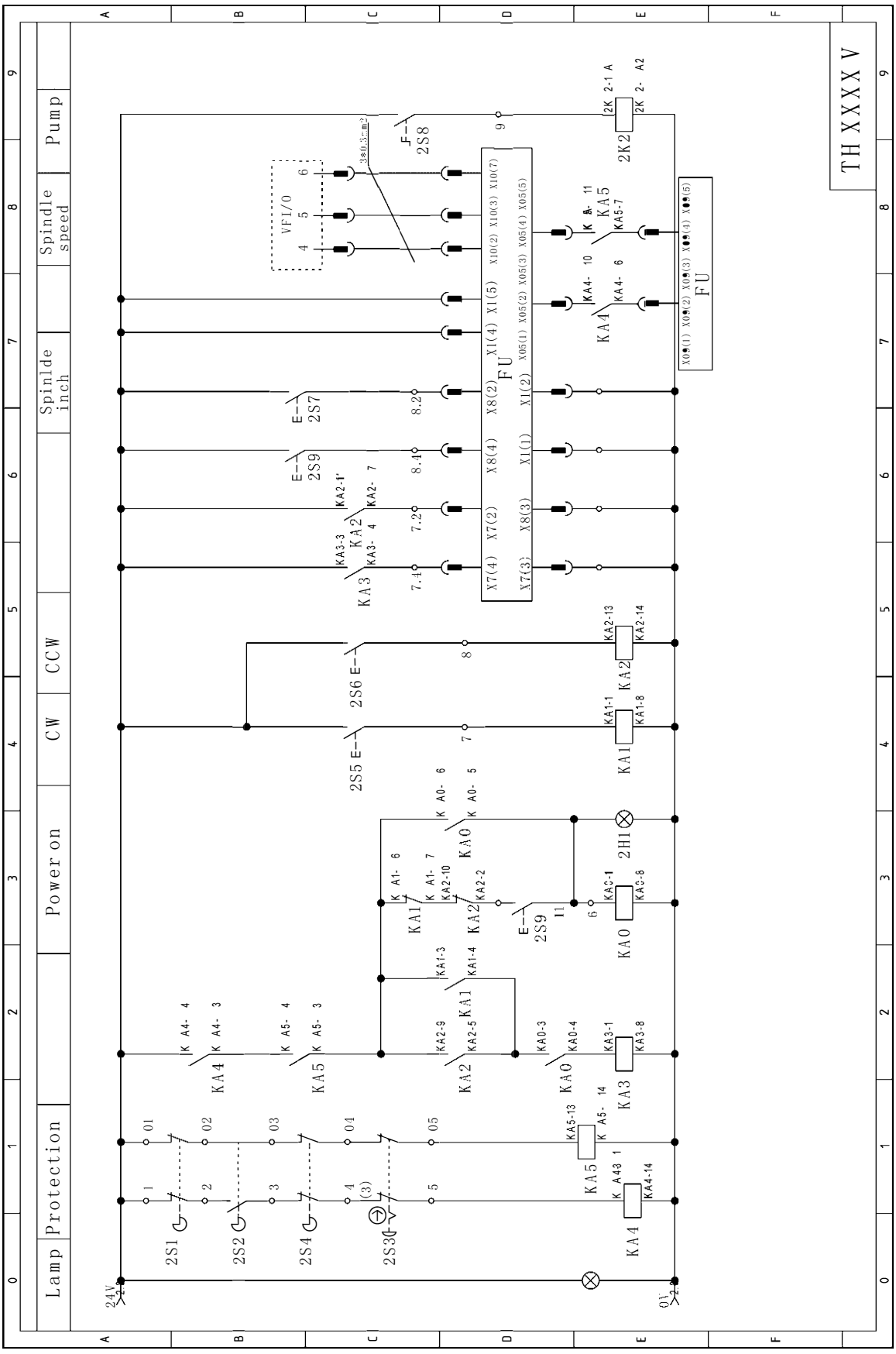
8.6 TH5620V - Schaltplan - Wiring diagram - DPA32 CSS

AK



TH5620V_wiring-diagram-for-DPA32.fm

AL



TH5620V_wiring-diagram-for-DPA32.fm

TH5620V - Ersatzteilliste Elektrische Bauteile - Electrical components parts list					
Pos.	**Bezeichnung**	**Description**	**Menge Qty.**	**Grösse Size**	**Artikelnummer Item no.**
F1	Sicherungsautomat	Circuit breaker	1		03402085F1
S1	Hauptschalter	Master switch			03402085S
FU	Frequenzumrichter	Frequency converter	1	SINAMICS G120	03462175FU
U	Stecker	Plug	1		03402085U1
V	Stecker	Plug	1		03402085V1
W	Stecker	Plug	1		03402085W1
1M1	Spindelmotor	Spindle motor	1	Y132M-4 ; 7.5 kW	03462110M1
1M3	Lüfter	Fan	1		034621751M3
1M2	Motor Kühlmittelpumpe	Coolant pump motor	1	AYB-25-125W/400V/ 50Hz	03462110M2
F2	Sicherung	Fuse	1	1A	
F3	Sicherung	Fuse	1	1A	
F4	Sicherung	Fuse	1	2A	
F5	Sicherung	Fuse	1	5A	
1G7	Netztteil	Power pack	1	Delta DRP0-24V/120W	03402070TC
1T1	Transformator	Transformer	1		034020851T1
F3	Sicherung	Fuse	1	1A	
A	Digitale Anzeige	Digital display	1	DPA32	03403027DPA32
Sensor	Drehzahlsensor	Speed sensor	1		03402085B1
HD	Maschinenlampe	Machine lamp	1		03402085HD
1S6	Schalter Maschinenlampe	Machine lamp switch	1		034020851S6
KA4	Steuerrelais Not-Halt-Schleife	Control relay emergency stop loop	1	Schneider RSB1A120BD/24VDC	03402085KA4
KA5	Steuerrelais Not-Halt-Schleife	Control relay emergency stop loop	1	Schneider RSB1A120BD/24VDC	03402085KA5
2S1	Schalter Fussbremse	Footbrake switch	2	Kedu QKS7	034020852S1
2S2	Schalter Riemenabdeckung	V-belt cover switch	1	QKS8	034020852S2
2S3	Not-Halt Schalter	Emergency-stop button	1	LA103-01ZS/1	034020852S3
2S4	Schalter Drehfuterschutz	Lathe chuck guard switch	1	KEDU QKS7	034020852S1
KA3	Steuerschütz Freigabe	Control contactor, enable	1		03402085KA3
KA0	Steuerschütz Null-Stellung Abfrage	Control contactor zero position query	1		03402085KA0
2S9	Reset	Reset	1		034020852S9
HL1	Betriebsleuchte	Power light	1		03402085HL1
KA1	Schütz Rechtslauf	Clockwise contactor	1		03402085KA1
2S5	Schalter Rechtslauf	Clockwise switch	1	KEDU QKS7	034020852S1
KA2	Schütz Linkslauf	Counter clockwise contactor	1		
2S6	Schalter Linkslauf	Counter clockwise switch	1	KEDU QKS7	034020852S1
2S7	Momenttaster	Direct run button	1		034020852S7
R	Potentiometer	Potentiometer	1		03402085R
2K2	Schütz Kühlmittelpumpe	Coolant pump contactor	1	SIEMENS 3TH40	034020852K2
2S8	Schalter Kühlmittelpumpe	Coolant pump switch	1		034020852S8

TH5620V_wiring-diagram-for-DPA32.fm

Schmierstoffe Lubricant Lubrifiant	Viskosität Viskosity Viscosité ISO VG DIN 51519 mm²/s (cSt)	Kennzeich- nung nach DIN 51502	ARAL	BP	Esso	Klüber Lubrication	Mobil	Shell	Texaco
Getriebeöl Gear oil Huile de réducteur	VG 680	CLP 680	Aral Degol BG 680	BP Energol GR-XP 680	SPARTAN EP 680	Klüberoil GEM 1-680	Mobilgear 636	Shell Omala S2 GX 680	Meropa 680
	VG 460	CLP 460	Aral Degol BG 460	BP Energol GR-XP 460	SPARTAN EP 460	Klüberoil GEM 1-460	Mobilgear 634	Shell Omala S2 GX 460	Meropa 460
	VG 320	CLP 320	Aral Degol BG 320	BP Energol GR-XP 320	SPARTAN EP 320	Klüberoil GEM 1-320	Mobilgear 632	Shell Omala S2 GX 320	Meropa 320
	VG 220	CLP 220	Aral Degol BG 220	BP Energol GR-XP 220	SPARTAN EP 220	Klüberoil GEM 1-220	Mobilgear 630	Shell Omala S2 GX 220	Meropa 220
	VG 150	CLP 150	Aral Degol BG 150	BP Energol GR-XP 150	SPARTAN EP 150	Klüberoil GEM 1-150	Mobilgear 629	Shell Omala S2 GX 150	Meropa 150
	VG 100	CLP 100	Aral Degol BG 100	BP Energol GR-XP 100	SPARTAN EP 100	Klüberoil GEM 1-100	Mobilgear 627	Shell Omala S2 GX100	Meropa 100
	VG 68	CLP 68	Aral Degol BG 68	BP Energol GR-XP 68	SPARTAN EP 68	Klüberoil GEM 1-68	Mobilgear 626	Shell Omala S2 GX 68	Meropa 68
	VG 46	CLP 46	Aral Degol BG 46	BP Bartran 46	NUTO H 46 (HLP 46)	Klüberoil GEM 1-46	Mobil DTE 25	Shell Tellus S2 MX 46	Anubia EP 46
	VG 32	CLP 32	Aral Degol BG 32	BP Bartran 32	NUTO H 32 (HLP 32)	Klübersynth GEM 4- 32 N	Mobil DTE 24	Shell Tellus S2 MX 32	Anubia EP 32
Hydrauliköl Hydraulic oil Huile hydraulique	VG 32	CLP 32	Aral Vitam GF 32	BP Energol HLP HM 32	NUTO H 32 (HLP 32)	LAMORA HLP 32	Mobil Nuto HLP 32	Shell Tellus S2 M 32	Rando HD HLP 32
	VG 46	CLP 46	Aral Vitam GF 46	BP Energol HLP HM 46	NUTO H 46 (HLP 46)	LAMORA HLP 46	Mobil Nuto HLP 46	Shell Tellus S2 M 46	Rando HD HLP 46
Getriebefett Gear grease Graisse de réducteur		G 00 H-20	Aral FDP 00 (Na-verseift) Aralub MFL 00 (Li-verseift)	BP Energrease PR-EP 00	FIBRAX EP 370 (Na-verseift)	MICROL-UBE GB 00	Mobilux EP 004	Shell Alva-nia GL 00 (Li-verseift)	Marfak 00

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Spezialfette, wasserabweisend Special greases, water resistant Graisses spéciales, déperlant			Aral Aralub	Energrease PR 9143		ALTEMP Q NB 50 Klüberpaste ME 31-52	Mobilux EP 0 Mobil Greas-erex 47		
Wälzlagerfett Bearing grease Graisse de roulement		K 3 K-20 (Li-verseift)	Aralub HL 3	BP Energrease LS 3	BEACON 3	CEN-TOPLEX 3	Mobilux 3	Shell Alva-nia R 3 Alva-nia G 3	Multifak Pre-mium 3
Öle für Gleitbahnen Oils for slideways Huiles pour glissières	VG 68	CGLP 68	Aral Deganit BWX 68	BP Maccurat D68	ESSO Febis K68	LAMORA D 68	Mobil Vactra Oil No.2	Shell Tonna S2 M 68	Way lubri-cant X 68
Öle für Hochfrequenzspin-deln Oils for Built-in spindles Huiles pour broches à haute vitesse	VG 68		Deol BG 68	Emergol HLP-D68	Spartan EP 68		Drucköl KLP 68-C	Shell Omala 68	
Fett für spezielle Schmi-erungen an CNC Werkzeu-gmaschinen (Fließfett) Grease for special lubrica-tion on CNC machine tools Graisse pour lubrification spéciale sur machines-out-ils CNC	NLGI Klasse 000 NLGI class 000		ARALUB BAB 000	Grease EP 000	Shell Gadus S4 V45AC	CEN-TOPLEX GLP 500	Mobilux EP 023		Multifak 264 EP 000
Fett für Hochfrequenzspin-deln Grease for Built-in spindles Graisse pour broches à haute vitesse	METAFLUX-Fett-Paste (Grease paste) Nr. 70-8508 METAFLUX-Moly-Spray Nr. 70-82 Techno Service GmbH ; Detmolder Strasse 515 ; D-33605 Bielefeld ; (++49) 0521- 924440 ; www.metaflux-ts.de								
Kühlschmiermittel Cooling lubricants Lubrifiants de refroidisse-ment			Aral Emusol	BP Sevora	Esso Kutwell		Mobilcut	Shell Adrana	Chevron Sol-uble Oil B

9 Malfunctions

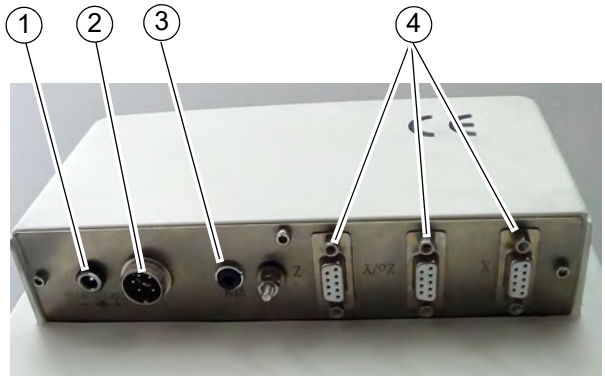
9.1 Machine malfunctions

Malfunction	Cause/ possible effects	Solution
Machine does not turn on	o Position switch spindle brake machine switches off o Position switch lathe chuck protection machine switches off o Position switch protection cover headstock machine switches off o emergency stop switch activated	o Check position switch spindle brake, adjust o Check position switch lathe chuck protection, adjust o Check position switch protective cover headstock, adjust o Unlock the emergency stop switch
Indicator light is not lit	o Control transformer is defective o Indicator light is defective	o Replace the transformer o Replace indicator light
Indicator light is not lit	o Control transformer is defective	o Replace the transformer
Motor is hot Motor has no power	o Machine connected incorrectly	o ► Warming up the machine on page 34
Feed will stop	o Clutch of the longitudinal feed or cross feed will slip.	o Adjust the clutch
Surface of workpiece too rough	o Lathe tool blunt o Lathe tool springs o Feed too high o Radius at lathe tool tip too small	o Resharpen lathe tool o Clamp lathe tool with less overhang o Reduce feed o Increase radius
V-belt squeaks V-belt slips	o V-belt wear down o V-belt tension is too loose	o ► V-belt check, re-tighten on page 84
Speed of rotation varies too much	o V-belt wear down o V-belt tension is too loose	o ► V-belt check, re-tighten on page 84
Workpiece becomes conical	o Centre are not aligned (tailstock offset) o Top slide is not exactly set to zero (when turning with the top slide)	o Align the tailstock to the centre o Align the top slide exactly
Lathe rattles	o Feed too high o Main bearings have clearance	o Reduce feed o Have the main bearings readjusted
Center runs hot	o Workpiece has expanded	o Loosen tailstock centre
Lathe tool has a short service life	o Cutting speed too high o For large infeed o Insufficient cooling	o Reduce cutting speed o Lower delivery / finishing stock allowance not over 0.5 mm) o More cooling

Malfunction	Cause/ possible effects	Solution
Flank wear too high	o Clearance angle too small (lathe tool "pushes") o Lathe tool tip not adjusted to centre height	o Increase clearance angle o Correct height adjustment of the lathe tool
Cutting edge breaks off	o Wedge angle too small (heat buildup) o Grinding cracks due to improper cooling o Excessive play in the spindle bearings (oscillations occur)	o Set greater wedge angle o Cool uniformly o Have the clearance in the spindle bearing arrangement re-adjusted
Turned threaded is wrong	o Lathe tool is clamped incorrectly or grinding has been started the wrong way o Wrong pitch o Wrong diameter	o Set the lathe tool to the centre, grind angle correctly Use 60° lathe tool for metric threads, 55° lathe tool for inch thread o Adjust right pitch o Turn the workpiece to the correct diameter

9.2 DPA32 Malfunctions and connection description

Basically, all connections are protected against external interference. Choose a place of operation that excludes inductive or capacitive interference influences on the electronic display or its connecting lines. When mounting the system keep a maximum possible distance from lines loaded with interference. If necessary, provide additional installations including screening shields or metallized housings. Contactor coils must be wired with spark suppression.

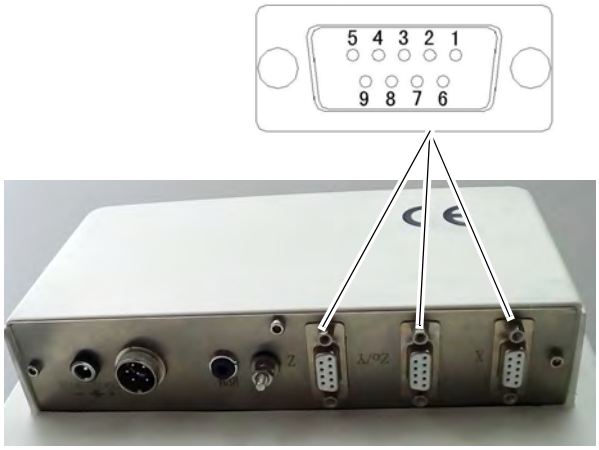


1	Power supply connection DPA32	
2	Control signal constant cutting speed	
3	Power supply speed sensor	
4	Connection of travel measurement signals	
	Working temperature	0 °C ... +40 °C
	Storage temperature	-30 °C ... +70 °C
	Humidity	90 % at 20°C + - 5°C maximum
	Protection type	IP51
	Weight	2.5 kg
	Electrical data:	
	Power supply Power supply unit	12 V to 30 V DC 230V
	Current consumption	~ 20W

9.2.1 Pinning of the reading signal connectors

INFORMATION

The digital position indicator is intended for operation with encoders that supply a TTL differential signal (TTL square wave) or a magnetic grid signal and a spherical grid signal.

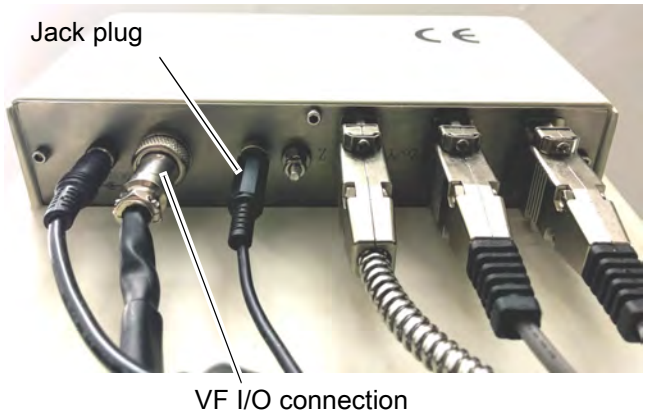


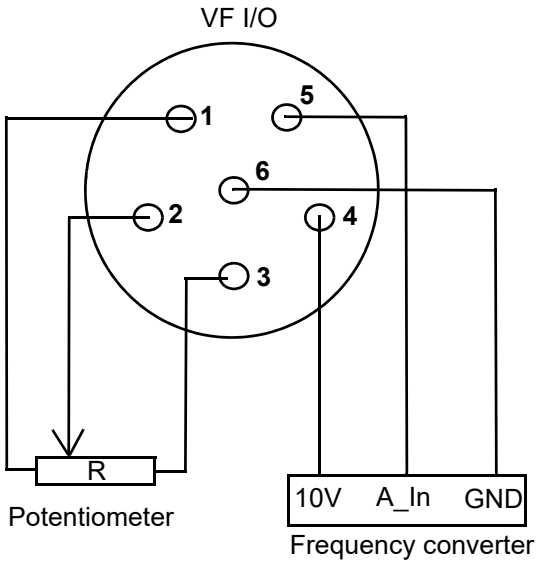
PIN No.	1	2	3	4	5	6	7	8	9	Housing
TTL differential signal for ML glass scales and active read head for magnetic strips	Z+	B-	not in use	B+	0V	Selection signal +	A-	A+	+5V	Shielding
Spherical grid signal for spherical scales	E+	S	+12V	E-	0V	not in use	not in use	not in use	not in use	Shielding

Note (selection signal +): The DPA32 can automatically identify the signal types based on this selection signal.

9.2.2 Analogue output interface VF I/O for spindle speed control

The sensor for speed measurement from the scope of delivery of the electronic display must be connected for this. Power is supplied via the rear jack plug.





Pin No.	1	2	3	4	5	6
Signal	10V	A_In	GND	10V	A_Out (0-10V)	GND

When the CSS function is started, the digital indicator outputs an analogue 0-10 V signal to control the spindle speed.

When the CSS function is off, the potentiometer signal controls the spindle speed.

9.2.3 Magnetic sensor and magnetic tape

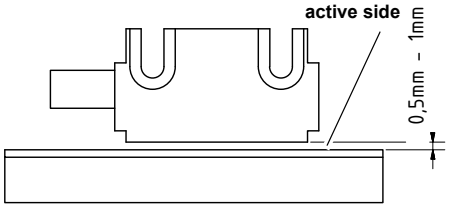
INFORMATION

A higher resolution entered in the digital position indicator does not lead to a better measuring result because no interpolation is carried out in the digital position indicator between the possible measuring steps of the magnetic tape with read head.

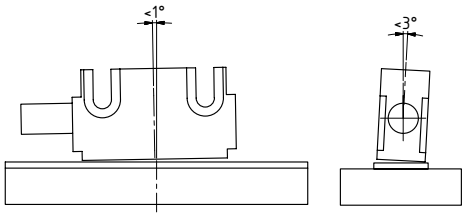
The pole length of the magnetic tape is decisive for the maximum resolution and system accuracy. The smaller the distances between the individual poles of the magnetic tape, the higher the accuracy class of the respective magnetic tape. The magnetic tapes we use have a resolution of 0.003mm. The resolution of the display itself should be chosen larger, i.e. about 0.005mm

Observe distance dimensions between sensor and magnetic tape as well as angle tolerances, these must be maintained over the entire measuring distance!

The max. gap without cover strip is 0.5 mm to 1mm. When using cover strip, the gap is reduced by the thickness of cover strip including its cover strip. The sensor may not touch the magnetic strip.



Img. 9-1: Sensor gap / Magnetic tape



Img. 9-2: Max. deviation

Img. 9-3: Alignment of sensor

9.2.4 Maintenance

The surface of the magnetic tape should be cleaned from time to time with a soft cloth in case of heavy contamination by dust, chips, moisture, etc.

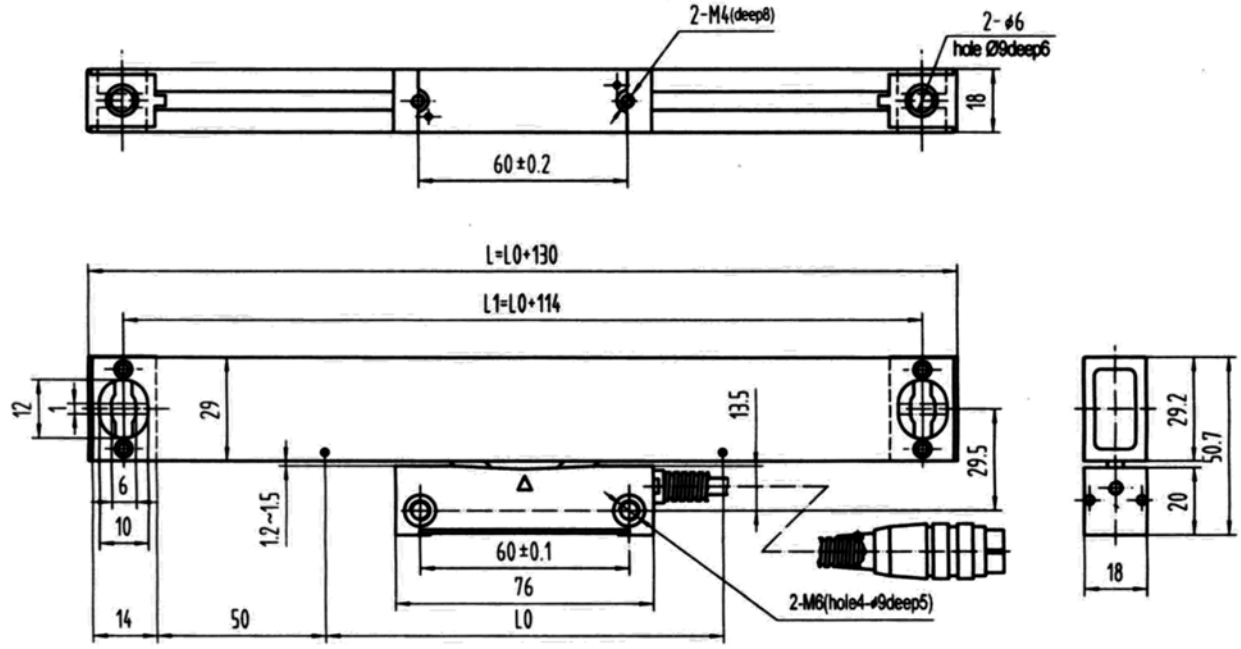
9.2.5 Trouble shooting

Typical errors that occur during operation:

- O The value shown on the display does not correspond to the actual value because the parameter setting for the counting resolution is set improperly.
- O Tolerance for the gap between magnetic sensor and magnetic strip not observed over the total travel distance, the sensor touches the magnetic tape.
- O Cable interruption / cut by sharp edges / cable squeezed.
- O Magnetic sensor's active side not mounted towards the magnetic strip.
- O Sensor has not been aligned.

9.2.6 ML Measuring bars - Dimensions

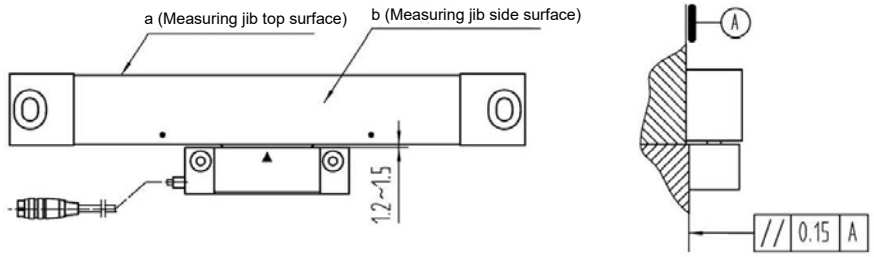
Measuring length	L_0 (mm)	50~500mm
Mounting length	L_1 (mm)	$L_1 = L_0 + 2\ (50+7) = L_0 + 114$
Total length	L (mm)	$L = L_0 + 2\ (50+15) = L_0 + 130$



ML Read head

Resolution 0.005mm (Counting resolution). Analogue output signal.

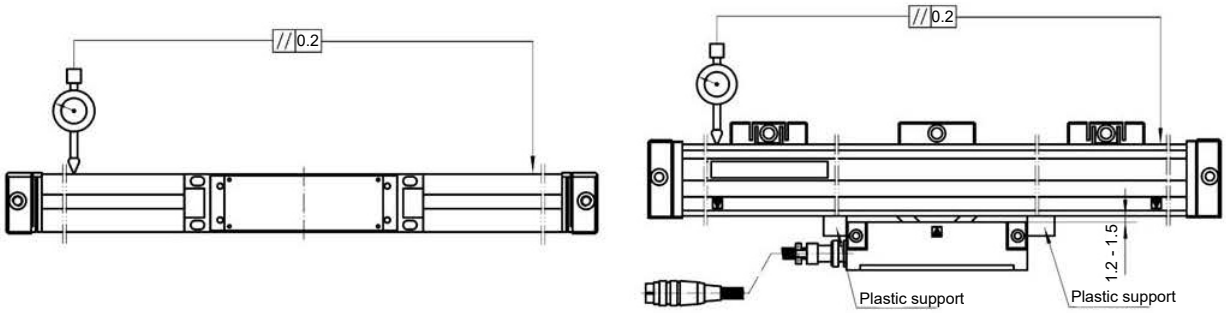
The measuring jib and sensor head are to be mounted separately on parts of the machine which are movable in relation to one another. The fixed and movable parts of the machine must correspond to the requirements and maximum tolerances as given in ☞ Img.9-4: .



Img.9-4:

→ Alignment of the reading head. The parallel error between the orthogonal side surfaces of the measuring jib and the machine-tool guide must be less than 0.2mm across the entire range. ☞

→ The maximum gap between the two parallel surfaces of the measuring jib and the sensor head is 1.2 to 1.5mm.



Img.9-5:

9.2.7 Trouble shooting

Typical errors that occur during operation:

- O The value shown on the display does not correspond to the actual value because the parameter setting for the counting resolution is set improperly.
- O Reading head is incorrectly connected. Check the connection.
- O The gap tolerance between measuring head and measuring jib was not maintained across the entire measurement range.
- O Cable interruption / cut by sharp edges / cable squeezed.
- O Moisture has penetrated extension cable plugs.
- O Travel speed is too high; it should not exceed 0.5 meters per second.
- O The replacement measuring jib is not from the same manufacturer as the original measuring jib. The actual counting resolution of the measuring jib does not correspond to the set value.

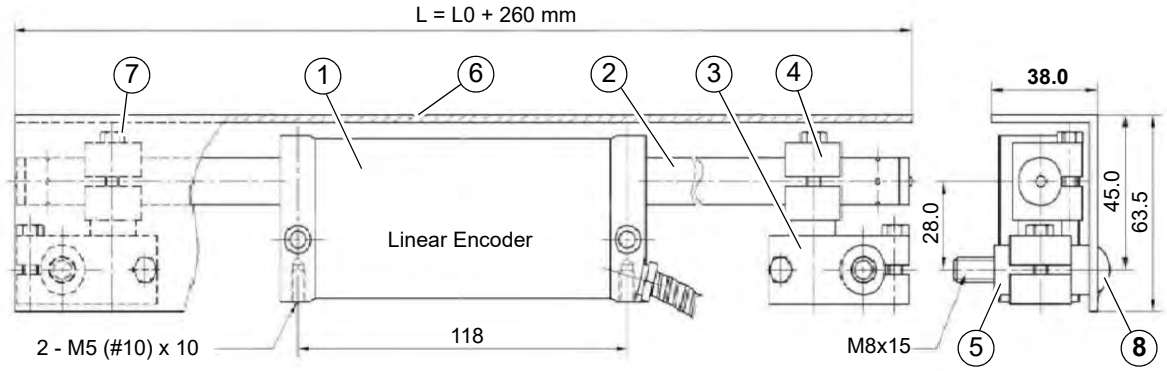
9.2.8 Ball scales

Resolution 0.005mm (Counting resolution). Analogue output signal.

Ball scales are already protected against dust and dirt in their design. Nevertheless, protection against external mechanical influences should be provided. Avoid strong temperature fluctuations, shock or vibration.

9.2.9 Ball scales - Dimensions

Measuring length L0 (mm)	51 mm - 11000 mm
Total length L (mm)	L = L0 + 260 mm



Pos.	Designation	Pos.	Designation
1	Reading head	2	Ball scale
3	Connection block for supporting scale and fixture	4	Fixed block for scale and fixture
5	Installation column for scale	6	Cover plate for scale and fixture
7	Screw M5 x 20	8	Screw M8

10 Appendix

10.1 Copyright

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Subject to technical changes without notice.

10.2 Terminology/Glossary

Term	Explanation
Headstock	Housing for the feed gear and the synchronous belt pulleys.
Lead- screw nut	Split nut which engages the lead screw.
Lathe chuck	Clamping tool for holding the workpiece.
Drill chuck	Drill bit adapter
Bed slide	Slide on the slideway of the machine bed which feeds parallel to the tool axis.
Cross slide	Slide on the slideway of the machine bed which feeds parallel to the tool axis.
Top slide	Swivelling slide on the cross slide.
Taper mandrel	Taper of the drill bit, the drill chuck or the centring point.
Tool	Lathe tool, drill bit, etc.
Workpiece	Piece to be turned or machined.
Tailstock	Movable turning aid.
Rest	Follow or steady support for turning long workpieces.
Lathe dog	Device or clamping aid for driving pieces to be turned between centres.
Threading gauge	Help with thread cutting

10.3 Change information manual

Chapter	Short summary	new version number
parts	Used measuring gibs	1.0.1
3	Interdepartmental transport	1.0.2
4.19 ; 3.13	Updated thread and feed table ; voltage peaks	1.0.3
	DPA32 added	1.0.4
4.21 ; 3.6.1 ; parts	Extended operating information DPA32 ; first oil change shortened from 200h to 50h ; Wiring diagram for DPA32 inserted	1.0.5
parts	Mechanical parts with rapid traverse inserted	1.0.6

10.4 Liability claims for defects / warranty

Beside the legal liability claims for defects of the customer towards the seller, the manufacturer of the product, OPTIMUM GmbH, Robert-Pfleger-Straße 26, D-96103 Hallstadt, does not grant any further warranties unless they are listed below or were promised in the framework of a single contractual provision.

- The processing of the liability claims or of the warranty is performed as chosen by OPTIMUM GmbH either directly or through one of its dealers.
  Any defective products or components of such products will either be repaired or replaced by components which are free from defects. Ownership of replaced products or components is transferred to OPTIMUM Maschinen Germany GmbH.
- The automatically generated original proof of purchase which shows the date of purchase, the type of machine and the serial number, if applicable, is the precondition in order to assert liability or warranty claims. If the original proof of purchase is not presented, we are not able to perform any services.
- Defects resulting from the following circumstances are excluded from liability and warranty claims:
  - Using the product beyond the technical options and proper use, in particular due to overstraining of the machine.
  - Any defects arising by one's own fault due to faulty operations or if the operating manual is disregarded.
  - Inattentive or incorrect handling and use of improper equipment
  - Unauthorized modifications and repairs
  - Insufficient installation and safeguarding of the machine
  - Disregarding the installation requirements and conditions of use
  - atmospheric discharges, overvoltage and lightning strokes as well as chemical influences
- The following items are also not subject to liability or warranty claims:
  - Wearing parts and components which are subject to a standard wear as intended such as e.g. V-belts, ball bearings, illuminants, filters, sealings, etc.
  - Non reproducible software errors
- Any services, which OPTIMUM GmbH or one of its agents performs in order to fulfil any additional warranty are neither an acceptance of the defects nor an acceptance of its obligation to compensate. Such services neither delay nor interrupt the warranty period.
- Place of jurisdiction for legal disputes between businessmen is Bamberg.
- If one of the aforementioned agreements is totally or partially inoperative and/or invalid, a provision closest to the intent of the warrantor is considered agreed upon, which remains within the framework of the limits of liability and warranty which are specified by this contract.

10.5 Storage

ATTENTION!

Incorrect and improper storage might result in damage or destruction of electrical and mechanical machine components.

Store packed and unpacked parts only under the intended environmental conditions.

Follow the instructions and information on the transport box:

O

O Fragile goods
(Goods require careful handling)

O Protect against moisture and humid environment
► Environmental conditions on page 22

O Prescribed position of the packing case
(Marking the top surface - arrows pointing up)

O Maximum stacking height

Example: not stackable - do not stack further packing case on top of the first one.

Consult Optimum Maschinen Germany GmbH if the machine and accessories are stored for more than three months or are stored under different environmental conditions than those specified here ► Information on page 6.

10.6 Dismantling, disassembling, packing and loading

INFORMATION

Please take care in your interest and in the interest of the environment that all component parts of the machine are only disposed of in the intended and admitted way.

Please note that the electrical devices comprise a variety of reusable materials as well as environmentally hazardous components. Please ensure that these components are disposed of separately and professionally. In case of doubt, please contact your municipal waste management. If appropriate, call on the help of a specialist waste disposal company for the treatment of the material.

Please make sure that the electrical components are disposed of professionally and according to the statutory provisions.

The machine includes electrical and electronic components and must not be disposed of as household waste. According to the European directive 2002/96/EG regarding used electrical and electronic devices and the implementation in national law, used electrical tools and electrical machines must be collected separately and collected for environmentally compatible recycling.

As the machine operator, you should obtain information regarding the authorized collection or disposal system which applies for your company.

Please make sure that the electrical components are disposed of professionally and according to the legal regulations. Please only throw depleted batteries in the collection boxes in shops or at municipal waste management companies.

10.6.1 Decommissioning

CAUTION!

Used machines need to be decommissioned in a professional manner in order to avoid later misuse and endangerment of the environment or persons.

- **Disassemble the machine if required into easy-to-handle and reusable assemblies and component parts.**
- **Dispose of machine components and operating fluids using the intended disposal methods.**

10.6.2 Dismantling

→ Pull the power cord or disassemble the connection cable and disconnect the connection cable.

10.6.3 Disassembly

→ Drain the oil

- from the headstock, drain hole ► „ Headstock“ on page 83
- from the feed gear, drain hole ► „ Feed gear“ on page 81
- from the apron, drain hole ► „ Apron“ on page 82

→ Drain the cooling lubricant, coolant drain.

→ Disassemble the drive motor

10.6.4 Packing and loading

→ Place the machine on 2 palettes to allow for removal transport
► Transport on page 25

10.7 Disposal of new device packaging

All used packaging materials and packaging aids from the machine are recyclable and generally need to be supplied to the material reuse.

The packaging wood can be supplied to the disposal or the reuse.

Any packaging components made of cardboard box can be chopped up and supplied to the waste paper collection.

The films are made of polyethylene (PE) and the cushion parts are made of polystyrene (PS). These materials can be reused after reconditioning if they are passed to a collection station or to the appropriate waste management enterprise.

Only forward the packaging materials correctly sorted to allow direct reuse.

10.8 Disposal of lubricants and coolants

ATTENTION!

Please imperatively make sure to dispose of the used coolant and lubricants in an environmentally compatible manner. Observe the disposal instructions of your municipal waste management companies.

INFORMATION

Used coolant emulsions and oils should not be mixed since it is only possible to reuse oils without pre-treatment when they have not been mixed.

The disposal instructions for used lubricants are made available by the manufacturer of the lubricants. If necessary, request the product-specific data sheets.

10.9 Disposal via municipal collection facilities

Disposal of used electrical and electronic components
(Applicable in the countries of the European Union and other European countries with a separate collecting system for those devices).

The sign on the product or on its packing indicates that the product must not be handled as common household waste, but that is needs to be disposed of at a central collection point for recycling. Your contribution to the correct disposal of this product will protect the environment and the public health. Incorrect disposal constitutes a risk to the environment and public health. Recycling of material will help reduce the consumption of raw materials. For further information about the recycling of this product, please consult your District Office, the municipal waste collection station or the shop where you have bought the product.

10.10 Product follow-up

We are required to perform a follow-up service for our products which extends beyond shipment.

We would be grateful if you could send us the following information:

- Modified settings
- Any experiences with the lathe which might be important for other users
- Recurring failures

Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26

D-96103 Hallstadt

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email: info@optimum-maschinen.de

EC - Declaration of Conformity

according to Machinery Regulation 2023/1230 Annex V Part A

The manufacturer / distributor Optimum Maschinen Germany GmbH
Dr.-Robert-Pfleger-Str. 26
D - 96103 Hallstadt, Germany

hereby declares that the following product

Product designation: Hand controlled lathe

Type designation: TH5620V

fulfils all the relevant provisions of the Machinery Regulation specified above and the additionally applied directives (in the following) - including the changes which applied at the time of the declaration.

Description:

Hand controlled lathe without numerical control

The following other EU Directives have been applied:

EMC Directive 2014/30/EC ; Restriction of the use of certain hazardous substances in electrical and electronic equipment 2015/863/EU

The following harmonized standards were applied:

EN ISO 23125: 2015-04 Machine tools - Safety - Turning machines

EN 60204-1: 2019-06 Safety of machinery - Electrical equipment of machines - Part 1: General requirements

EN 13849-1: 2016-06 Safety of machinery - Safety related parts of controls - Part 1: General design principles

EN 13849-2: 2013-02 Safety of machinery - Safety related parts of controls - Part 2: Validation

EN ISO 12100: 2011-03 Safety of machinery - General principles for design - Risk assessment and risk reduction

EN 55011: 2022-05 Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement - class A

EN 61800-3: 2019-04 Variable speed electrical drives – Part 3: EMC product standard including specific test methods.

EN 61800-5-1: 2017-11 Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy

Name and address of the person authorized to compile the technical file:

Kilian Stürmer, phone: +49 (0) 951 96555 - 800

Kilian Stürmer (CEO, General Manager)
Hallstadt, 2023-11-07

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